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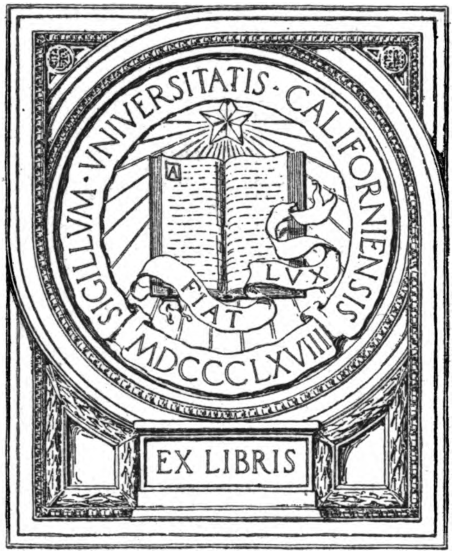

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VOL III JANUARY, 1908 No. 1

THE BULLETIN

OF THE

UNIVERSITY OF NEBRASKA

COLLEGE OF MEDICINE

PUBLISHED BY THE UNIVERSITY

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LINCOLN, NEBRASKA

ENTERED AT THE POST-OFFICE IN LINCOLN, NEBRASKA, AS SECOND-CLASS MATTER, AS UNIVERSITY BULLETIN SERIES XIII, NO. 3

THE BULLETIN

OF THE

UNIVERSITY OF NEBRASKA

COLLEGE OF MEDICINE

VOL. III - NOS. 1-4

146 PAGES, 1908

LINCOLN, NEBRASKA

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An Inquiry into Compensatory Blood-Pressure Mechanisms[1]

BY C. F. CHARLTON, LINCOLN, NEBRASKA

INTRODUCTION

The vaso-motor nerves are those of the nervous system which have to do with the regulation of the caliber of the blood vessels of the body—a physiological rôle of probably the greatest importance. The first experiments pointing to the existence of such fibers were made by Claude Bernard as early as 1851. His method consisted simply in severing the cervical sympathetic nerve of a rabbit and observing that the blood vessels of the ear became very much dilated. Later, Brown-Séquard, on stimulating the peripheral end of the same nerve, showed that the caliber of the blood vessels was diminished, thus demonstrating the existence of vaso-constrictors. Vaso-dilator fibers, or those which when stimulated cause a widening of the vessels, were surmised by Schiff in 1855 and demonstrated by Bernard in 1858. The latter found that when the chorda tympani nerve is stimulated the arteries supplying the submaxillary gland become very much dilated and a greater quantity of blood flows thru them. Other nerves have been found to give this same kind of a result, i. e. a flushing of the part supplied. Most prominent are the nervi erigentes to the penis and nerves in the glosso-pharyngeal and cervical sympathetics to the buccal and pharyngeal regions. Such an action (dilation of the vessels) is not easily explained when we consider the musculature of the vessels. The circular coat evidently brings about vaso-constriction. It is not clear how any action of the longitudinal coat could materially affect the diameter of the vessels. We know that the dilator fibers are not in tonic activity, for sectioning of one of these nerves gives no marked result. Another manner in which they might possibly act is by an inhibition of the tonic contraction of vaso-constrictor muscles. Such an action would be very similar to the inhibitory action of the vagus on the heart musculature. The vaso-constrictors are, on the contrary, in a state of tonic activity and keep the circular muscles in a condition of tone. When any large nerve trunk is stimulated, such as the sciatic, variable results are obtained. The usual effect is a constriction when the peripheral end is stimulated by a strong current. This vaso-constriction is often followed, however, by a vaso-dilation. Stimulation with a weak current gives a vaso-dilation. This has been taken to show the existence of both kinds of fibers in the nerve, and the assumption is made that the vaso-constrictors are the more readily excited but are finally overcome by the stronger action of the dilators.

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[1] From the physiological laboratory of the University of Nebraska.

The relation of the two sets of fibers to the central nervous system is partly revealed by a section of any portion of the cervical region of the cord. Such a section is followed by a loss of tone of practically all the blood vessels. The latter become very much dilated and the arterial pressure falls from a level of 100-150 mm. Hg. to 20-30 mm. Hg. or less. In such a condition the blood is collected mainly in the skin and splanchnic areas. Consequently the arterial blood-pressure resulting in part from the tonic constriction of the arterioles of the regions mentioned is dependent upon the integrity of the cervical cord, and a rational conception of the function of the cervical cord is that it serves as the pathway for constrictor impulses which come from higher levels. The location of a center controlling these vaso-motor impulses was determined by Dittmar. By sectioning the medulla at various levels he found its location to be about the middle of the fourth ventricle in the tegmental region. Sectioning below this point gave a complete loss of tone of the vascular system. This vaso-motor center is considered as being normally in a state of tonic activity and constantly sending out impulses to the musculature of the vessels, which keeps them in a more or less contracted condition. This is easily shown by dividing a nerve supplying a vascular area, whereupon the area supplied, being removed from the tonic influence of the center, becomes flushed with blood. The vaso-motor center is very susceptible to reflex stimulation. By stimulating certain definite nerves its tone is greatly increased, the arterioles are constricted, and we get a corresponding rise in arterial pressure. Afferent nerves which give this result have been given the name of pressor nerves. But it has also been shown that when other, likewise definite nerves are stimulated there is a dilation of the arterioles and a fall in the arterial pressure, and these fibers are supposed to exert an inhibitory influence on the tone of the center and are given the name of depressor nerves. Nearly all the prominent sensory nerves act as pressor fibers, especially the anterior crural nerves. Other nerves, such as the sciatic, may contain both kinds of fibers and upon stimulation give variable results. The best example of a depressor nerve is the so-called depressor nerve of the rabbit. It is an entirely distinct nerve in this animal and invariably gives a pure depressor effect when it is stimulated. By its connection with the heart and aortic plexus it forms an admirable mechanism for the regulation of aortic pressure. With a rise of blood pressure in the aorta inhibitory influences are sent over this nerve to the vaso-motor center, causing a general vascular dilation. In the dog this nerve does not exist as a separate nerve, but is incorporated with the vagus, which includes likewise the constrictor fibers for the head running in the cervical sympathetic nerve. Finally, it is important from the present standpoint to mention the fibers in the dog's vagus which influence the respiration and, indirectly, in this way affect blood-pressures. Stimulation of the central end of the cut vagus produces, therefore, complex results, which is not surprising in view of the afferent fibers which are contained in it.

Porter and Beyer[2] limit the function of the vaso-motor center to raising or lowering the general blood-pressure, and do not give it the power of localizing an increased blood-supply to a particular area. Such a function is left to a still higher center (cerebral) or to a definite reflex path to particular cells of the center. They base their assertion on the result of repeated stimulation of the depressor nerve with the invariable result of a flushing of the splanchnic area, showing a definite connection between this nerve and the splanchnic vaso-motor fibers.

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[2] Porter and Beyer: *Am. Jour. of Physiol.*, 1900, IV, p. 283.

No vaso-dilator center such as we have for vaso-constriction has been located, and it is the belief that there exist numerous secondary centers in the cord which act in this capacity. When the thoracic portion of the cord is divided in the dog, the power of erection of the penis is not lost. This can only be explained by the existence of a secondary center in the lumbar portion of the cord. This particular center is also under cerebral control and may be stimulated by psychical activities.

The vaso-constrictor center is the vital point in the maintenance of arterial pressure, and its physiological condition has a practical application in surgical shock. Shock, as is well known, is usually accompanied by a great fall in blood-pressure, so much so, in fact, that Crile places the cause of death during shock to an insufficiency of this center in maintaining its tone, and thus allowing so great a fall in arterial pressure that the vital centers cease to function thru lack of blood-supply. The two factors that play the most important part in any alteration of this center would be its blood-supply and the possible effect of over-stimulation. With this in mind experiments were made to determine, (1) the effect of stimuli of great intensity applied to afferent nerves; (2) alterations of the blood-supply to the center.

It is not the purpose of this paper to give in detail the results obtained thru stimulation of afferent nerves. It will suffice to say that the usual effect obtained on applying a strong, interrupted, induced current for ten seconds to the central end of the cut vagus of a dog, the other vagus having also been sectioned, was a marked rise in carotid blood-pressure, which, after the stimulus had ceased, rapidly gave way to a fall of pressure below the normal, followed, in turn, by a complete recovery. Repeated stimulation in this manner for hours showed no decline in the vigor of the vaso-constrictor center. With prolonged, continued stimulation all apparent changes in the center which appeared were easily referable to alterations at the point of application of the electrodes, since a slight shifting of the point of stimulation immediately restored the pressure to its high level. The experiments point in the direction of the conclusions expressed by Porter,[3] that the endurance of the vaso-constrictor nerve cells under stimulation is very great.

It was during the investigation of the effects of alteration of blood-supply to the brain that certain peculiar variations in blood-pressure became strikingly apparent and demanded an explanation in order that the prosecution of the more general problem might go on. These variations form the basis of this paper. They can be presented most easily by outlining a typical experiment.

METHOD

Altogether fourteen dogs were used in these experiments. Ether was used as the anesthetic preceded by a hypodermic injection of morphine (0.04 gms. per kilo). In each case an attempt was made to have the depth of the anesthesia more or less uniform by permitting the action of the corneal reflex. The blood-pressure was determined by the use of a mercury manometer and the cannula was in each case placed in the left common carotid. Three writing points marked on the drum surface. Two were electric signals showing the duration of stimulation and the time record in seconds respectively, while the third gave a blood-pressure tracing. The time record was in each case placed at the zero pressure line. A median incision was made in the neck, and the vagi, the common carotids, and the internal and external jugulars were isolated on both sides from the point where they leave the upper edge of the thorax to a point very close to the skull. The vertebral arteries were exposed at the point where they pass between the longus colli and the scalenus anticus muscles. A thread was passed under them to facilitate their handling. In all cases the tissues were kept moist with normal saline.

EXPERIMENTS

When a dog has been prepared as indicated above and the left common carotid is properly brought into connection with the manometer, there results a blood-pressure tracing showing both cardiac and respiratory waves. As long as the conditions remain unchanged the height of the pressure remains at the same average level. If then an artery clamp is suddenly placed on the right common carotid, the blood-pressure, as indicated by the mercury manometer, which for convenience will be called body-pressure, rises about thirteen and one-half millimeters. Average of four readings in two animals. Upon removal of the clamp the pressure returns to normal if it has not already done so. Without the anesthesia the return might possibly be more prompt. Figure 1 gives a typical experiment of this kind and is described by the accompanying legend. At 6 the clamp was put in place. The pressure in the artery rose immediately, showing, however, a tendency to diminish, so that at 7, when the clamp was removed, the curve was already on its descent. Simultaneous clamping of the vertebrals, with open carotid, produces unimportant changes, if any. This can be seen in figure 1 at 5. The irregularity in the tracing preceding 5 is due to mechanical causes which arise from the difficulty of getting at the vertebrals in order to put the clamps on them. Clamping the external and internal jugulars in rapid succession with open arteries causes a slight fall (14 mm. Hg.) and return to normal (see figs. 1–3), while unclamping of the veins gives a rise above normal (8 mm. Hg.) and then back to normal. (See figs. 1–4.)

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[3] Porter: *Am. Jour. of Physiol.*, 1907, XX, p. 405.

In all cases mentioned above an interference with the normal supply of blood to the head of the animal shows but unimportant changes of blood-pressure in the body region. Such an interference, it would seem, should affect the vaso-motor center. That it does not finds an explanation in the existence of a compensatory mechanism which at all times tends to maintain the blood-pressure at a constant level.

If now, both vagi are sectioned, the most prominent effects of such a section are these. The blood-pressure usually rises thru an increase in the rate of heart beat; the respiration becomes deeper, slower, and shows pronounced pauses at the end of both inspiration and expiration. When the blood-preessure has again reached a constant level the above experiments may be repeated with the following results: A clamp placed upon the right common carotid brings about an enormous rise of body blood-pressure. This can be seen by referring to figure 2. At 17 the pressure rises from 136 mm. Hg. to 176 mm. Hg. in twenty-four

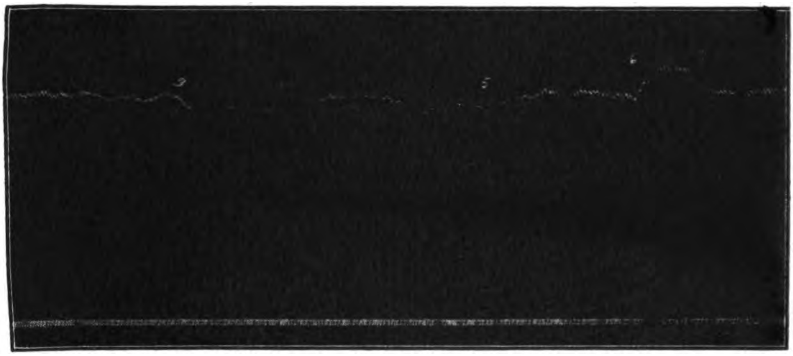

Fig. 1 (reduced × ½). Blood-pressure tracing from a dog with cannula in left common carotid. Vagi intact. 3, Clamping in rapid succession external and internal jugular veins; 4, unclamping of the veins; 5, clamping of vertebrals; 6, clamping of right common carotid; 7, unclamping of carotid. Time tracing in seconds.

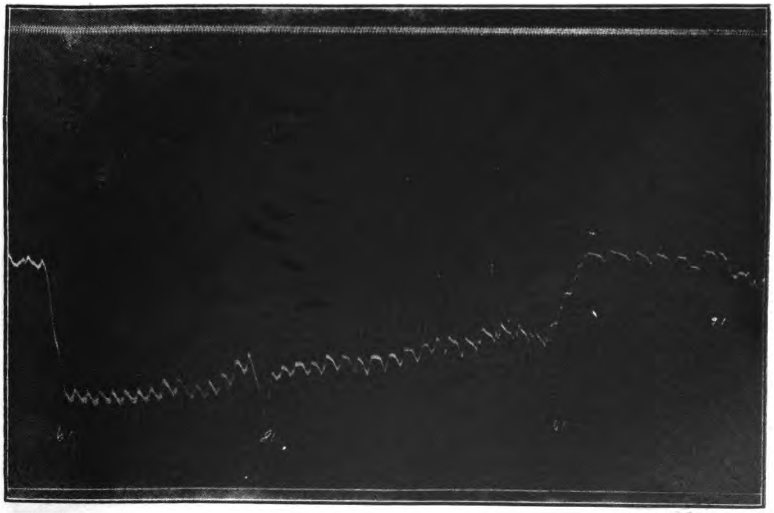

Fig. 2 (reduced × ½). Blood-pressure tracing from a dog with cannula in left common carotid. Vagi cut. 16, Clamping of external jugulars; 17, clamping of right common carotid; 18, unclamping of jugulars; 19, unclamping of right carotid. Time tracing in seconds.

seconds. The rise is, therefore, rather abrupt. After this the pressure continues to rise at a much slower rate during the next five minutes when it reaches a height of 220 mm. Hg. At 19 the clamp was removed, resulting in a rapid fall of pressure to normal. The fall occupied just twenty seconds.

Clamping of the external and internal jugulars, with cut-vagi and open arteries, gives a fall of body pressure (16 mm. Hg.) not differing markedly in extent from that obtained with uncut vagi. With closed arteries and divided vagi these oscillations in pressure become more extensive (20 mm. Hg.) as can be seen at 18, figure 2. Such variations of body-pressure as are obtained by clamping of the veins, whether the vagi are intact or are cut, whether the carotid supply is open or not, are most readily explained thru the variations in the amount of blood supplied to the right auricle. An increase in the quantity of blood supplied to the right auricle permits a greater output from the left ventricle and so raises the pressure, while a diminution in the quantity supplied diminishes the pressure. Clamping of the vertebrals is inefficient in modifying the body blood-pressure because of the relatively small amount of blood carried by them in contrast with the amount carried by the carotids. The striking differences come out in clamping the carotids with vagi cut on the one hand, and with the vagi uncut on the other hand.

It is quite obvious that this difference is immediately due to the cutting of the vagi, and, furthermore, the compensatory mechanism which normally keeps the blood-pressure constant must have been rendered inactive by the same procedure. As a matter of fact, we have in the depressor fibers of the vagus a means by which impulses due to an increased pressure in the root of the aorta may be transmitted to the vaso-constrictor center in the medulla and lead to an inhibition of its tonic activity. This brings about a diminution of the impulses from the vaso-motor center which make their way down the cord and pass to their terminations by way of the fibers of the autonomic system. The effect is a dilatation of the arterioles of the body generally, but mainly of those of the splanchnic area. There follows a decrease in general blood-pressure. Simultaneously, there may take place an inhibition of the heart thru vagus fibers, also leading to a diminution of body-pressure. There is no evidence that the latter method of lowering blood-pressure was active in the experiments made for this paper. Such evidence would be an alteration of heart beat either in rate or force.

The increase in pressure so strikingly shown in figure 2 is, then, a phenomenon which results from damage to the normally compensating mechanism. The question which arises and which must be answered in a study of the vaso-motor center is whether the rise of pressure on clamping the carotid is due to a stimulation of the vaso-constrictor center. Since a rise of pressure in the aorta leads to an inhibition, may not a diminution of blood-pressure lead to an excitation, thus causing a vaso-constriction generally? When the clamp is placed on the carotid the pressure in the brain is suddenly lowered, and when the clamp is removed the pressure is restored. Simultaneously, or nearly so, the body pressure varies in an inverse direction. In addition, it has been determined that an anemia of the vaso-constrictor center gives rise to its excitation. Clamping of the carotids might diminish the blood supply in extent equivalent to anemia. On the other hand, it is conceivable that the rise in body pressure shown in figure 2 may be largely or entirely a mechanical effect, for clamping the carotid suddenly produces a great increase of peripheral resistance, which would also raise the body pressure.

Various methods of procedure were adopted to answer these questions. Owing to the great collateral venous circulation to the head, it was found impossible to stop the flow of blood by clamping of the jugulars. The latter remained clamped for fifteen minutes in one experiment without the slightest increase of body blood-pressure. It is impossible to tell how much such a procedure raises the pressure in the arterioles of the head, but later experiments, during which simultaneous tracings of the pressure in the head end of the right external jugular were taken, show that it does rise. Such variations in head pressure were augmented in a number of experiments by connection of the head end of the left common carotid with a reservoir of 0.7 per cent saline under varying pressures. The latter varied from 140 to 150 mm. Hg. pressure and showed immediately in an augmented venous pressure in the right external jugular.

TABLE I

Showing the effect of injection of 0.7 per cent saline at 140–150 mm. Hg· pressure into the peripheral end of the left common carotid.

	BLOOD-PRESSURE PREVIOUS TO INJECTION OF SALINE	BLOOD-PRESSURE JUST AFTER INJECTION OF SALINE
Vagi cut, carotids clamped	Body-pressure 180 mm. Hg. Venous pressure 17.5 mm. Hg.	Body.pressure rises at same rate Venous pressure 29 mm. Hg.

The results shown in table I show conclusively that an increase in pressure in the arterioles of the head does not influence the vaso-motor center. Indirectly they show, likewise, that the diminution of pressure produced by clamping the carotid is not responsible for the increase in body-pressure because such a diminution of pressure to the arterioles was counterbalanced by the pressure of the injected saline, a procedure which in no way altered the rise in body blood-pressure. There remain, then, two factors. One of these is the anemia which results on cutting off the blood supply to the head; and the other is the peripheral resistance to the body circuit when the clamp is suddenly placed on the artery. Both factors, it appears, enter into the production of the results. Thus in figure 2 at 17 the first immediate rise may be looked upon as mainly due to the increased peripheral resistance, while the latter more gradual rise may result partly, at least, from an increasing asphyxia. It must be said, however, that all curves do not show this abrupt change in rate of rise. On this view the abrupt fall at 19 on removal of the clamp is self-evident.

CONCLUSIONS

1. The abrupt rise of body blood-pressure on clamping the carotids is mainly due to the increased peripheral resistance, which, owing to the section of the vagi, is uncompensated.

2. The experiments indicate that a moderate diminution of pressure in the common carotid above its point of origin does not affect the vaso-motor center.

3. That a moderate increased pressure in the arterioles of the head does not affect the vaso-motor center.

Recent Prominent Advances in Physiology[1]

BY A. E. GUENTHER, LINCOLN, NEBRASKA

It is no simple task to present in brief but adequate outline the advances made in physiology during recent years, even when the presentation is to be limited to the more striking advances only. So great have been the changes in some directions that they have revolutionized former conceptions, have given entirely new aspects to certain physiological mechanism, and have brought about, as a consequence, alterations in many practical questions and applications. The influence of a new science, physical chemistry, is largely responsible for this vigorous growth and forms a brilliant instance of what has been noted repeatedly—that any great advance in one science leads directly to marked advances in the related sciences. For physiology is nothing more nor less than the application of physics and chemistry to living things, and physiological conceptions are determined and fixed by the conceptions of physics and chemistry. There are now only isolated instances in which prominent thinkers dealing with the phenomena of life take refuge in vital forces. The attitude of the great majority of investigators is, at the least, one of abeyance. They, see the inadequacy of present known forces in the explanation of the more recondite problems of physiology, but, knowing the progress that has been made, they set no definite limit to the possibilities of explanation thru physical and chemical forces when the conditions under which the latter act will be known.

There is no department in physiology which during recent years has not been able to point to numerous concrete evidences of advancement. These discoveries are sometimes interesting or important or the reverse. In the physiology of the blood, as an example, there are to be considered, on the one hand, the relatively unimportant discovery that the red corpuscles are not biconcave discs, as has so long been thought to be the case, but are, while in the intact circulation, bell-shaped; and there are, on the other hand, the incalculably important discoveries dealing with hemolysins, agglutinins, precipitins, opsonins, etc. Apart from its value in throwing light on the possibilities or limits of the transfusion of blood from one individual into another, our knowledge of hemolysins aids in giving insight into the nature, production, and action of toxins and anti-toxins; knowledge of precipitins has given the best test for human blood that has thus far been devised and is of tremendous value in medico-legal cases in the identification of blood stains; knowledge of opsonins is finding practical application in the diagnosis and treatment of disease. The chemical composition of the blood, it is clearly evident, is one of very great complexity and at present lies largely outside of the ordinary methods of chemical investigation. The marvelous adaptation which the body displays of protecting itself by forming in the blood hemolysins, agglutinins, precipitins, anti-toxins, etc., are processes not explainable chemically and are therefore designated *in toto* as biological reactions.

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[1] Presented to the Nebraska Academy of Science, Dec. 27, 1907.

By the term biological reaction is meant, of course, something entirely different from the ordinary chemical reaction of the blood. The latter, determined by some indicator as litmus or lacmoid, is said to be alkaline, and there is no doubt that blood has the power of turning red litmus blue. As ordinarily estimated the alkalinity of the blood is equal to a 0.2 or 0.3 per cent solution of sodium carbonate. In such an estimation the alkalinity is determined by titrating the plasma with a weak solution of tartaric acid equal about to a 1-200 to 1-400 normal solution, using, perhaps, litmus as an indicator. It has been found that this degree of alkalinity, properly called the titration alkalinity, does not correspond with the degree of alkalinity determined by the methods of physical chemistry, or, in other words, the true alkalinity. In accordance with present conceptions, whenever a solution or liquid is acid, the acidity is the result of the fact that there exist in it free hydrogen ions, and an alkaline liquid is alkaline because in it there exist free hydroxyl ions. Blood plasma contains no more free hydroxyl ions than does pure water, consequently it is neutral. The discrepancy between the titration alkalinity and the true alkalinity is due to the fact that the salts in the plasma exist not only in the form of intact molecules but are partly dissociated into corresponding ions. The dissociation of molecules into ions and the union of the latter into molecules are going on continually, and these processes sooner or later come into equilibrium when the action in one direction is equal per unit of time to the reaction in the reverse direction. The condition of equilibrium is dependent upon the relative numbers of ions and molecules in solution and is upset whenever the number of particles of one kind or the other, as the case may be, is altered. Dissociation or association then sets in and the equilibrium is restored at a different level. In such a solution as plasma, where a strong base (sodium) is in combination with a weak acid (carbonic), the alkalinity can not be determined by titration with an acid stronger than carbonic. If tartaric acid, for example, is used, it yields its own hydrogen ion to combine with the hydroxyl ion, while its own anion will combine with the sodium. As a result the equilibrium is upset and more sodium carbonate dissociates. The titration method, therefore, gives the amount of sodium in the blood which can unite with the acid employed in titrating.

Another notable change, bearing on the chemical composition of the blood, exists in the uncertainty which has arisen regarding the individuality of several of the proteins of the plasma. Not only do the three separate coagulations of serum-albumin at 73, 77, and 84 degrees Centigrade indicate the possibility of three separate proteins, but an unsatisfactory state of affairs has arisen from the statement made recently that under certain conditions of temperature and reaction serum-albumin may be converted into a globulin body that precipitates upon one-half saturation with ammonium sulphate. Paraglobulin, a second protein of the blood, has been definitely shown to be a mixture of at least two separate globulins. One of these, euglobulin, is precipitated upon one-third saturation with ammonium sulphate, and the other, pseudoglobulin, comes down upon one-half saturation with the same salt.

In the physiology of the circulation the greatest recent advances have evolved about investigations into the causation of the heart-beat, the properties of the auriculo-ventricular bundle of His, and the elaboration of blood-pressure measuring apparatus. Howell in the *Journal of the American Medical Association,* June, 1906, summarizes with reference to the causation of the heart-beat in the following words:

"In order to picture the relations of the inorganic salts to this process the hypothesis which I have adopted as a heuristic principle to guide my own investigations may be stated as follows: The well-nourished heart contains a large supply of energy-yielding material, which is in a stable form, so that it neither dissociates spontaneously, nor can be made to do so by the action of external stimuli. It is possible that this stable, non-dissociable form consists of a compound between it and the potassium or the potassium salts, and that herein lies the functional importance of the large amount of potassium contained in the tissue. This compound reacts with the calcium or with the calcium and sodium salts, and a portion of the potassium is replaced and a compound is formed which is unstable. At the end of the diastolic period this compound reaches a condition of instability such that it dissociates spontaneously, giving rise to a chain of events that culminates in the normal systole. Before spontaneous dissociation occurs it may be hastened prematurely by an external stimulus, as we know to be the case when a mechanical or electrical shock is applied to the heart at any time after diastole has begun.

"From this point of view the rôle of the calcium, or of the calcium and the sodium salts consists in replacing the potassium and converting a part of the store of stable material into an unstable, easily dissociable compound. We are not obliged, therefore, to assume the existence of any specific inner stimulus."

In 1903 His, Jr., described a band of muscle fibers, which, running up and back in the septum of the ventricles into the auricles, formed a muscular connection between the auricles and the ventricles. This auriculo-ventricular bundle of His, as it is called, forms in man a structure eighteen millimeters in length, two and one-half millimeters in breadth, and one and one-half millimeters in thickness. It was a discovery which had an important bearing on a controversy which has been going on for years regarding the manner in which the wave of contraction is propagated over the heart. Those holding to the neurogenic doctrine maintained that the transmission took place thru the nervous system, while the advocates of the myogenic doctrine assumed that the excitation wave propagated itself from muscle cell to muscle cell. The discovery of His was distinctly in favor of the myogenic doctrine. The most interesting physiological study of this bundle is that of Erlanger, who, by means of a special clamp, was able to show that pressure exerted upon this bundle brought about an incoordination in the beat of the auricles and ventricles. With a gradually increasing pressure upon the bundle of His the disturbance took a definite sequence in that, instead of each auricular beat being followed by a ventricular beat, some of the latter dropped out, resulting in a ratio, possibly, of one ventricular beat to every two, three, four or so auricular beats. Finally, there may result a complete independence of ventricular and auricular beats, the ventricle taking on a much slower independent rythm. The bearing of these experimental facts on a form of heart disease, long known as Stokes-Adams syndrome, was recognized immediately. As Erlanger states, the main symptoms of Stokes-Adams disease are explained by the effects of heart-block. The epileptiform attacks may be looked upon as due to anemia of the brain, analogous to those that follow hemorrhage in warm-blooded animals, or in the case of apoplectiform attacks the trouble may result from venous congestion of the brain, a condition which is associated with an altered respiration. Erlanger has recently, as a logical continuation of his experiments, shown that the physiological properties of the bundle of His do not differ essentially from those of auricular tissue. By crushing the auricular tissue along convenient lines he has succeeded in establishing the same disparity of beat between different regions of the auricle as are brought out between auricle and ventricle.

Not least among the interesting developments concerning the heart is the remarkable vitality which it manifests under experimental conditions. In 1901 Locke maintained the beat of a rabbit's heart for practically five days by the use of the solution which bears his name. Kuliabko succeeded in reviving a part of the heart seven days after the death of the animal, and the same investigator made the heart of a child beat twenty hours after death from pneumonia.

In the development of measuring blood-pressures in human beings we are again principally indebted to Erlanger. The Erlanger sphygmomanometer is, no doubt, the most accurate, convenient, and reliable blood-pressure machine that is in existence and has the additional advantage of giving both systolic and diastolic pressures and of yielding a permanent record. Knowing the diastolic and systolic pressures, the mean pressure may be calculated, but the reverse process of calculating the diastolic and systolic pressures from the mean is impossible. It has been shown by Dawson in particular that the high and the low pressures may vary independently so that the determination of each is desirable. The pulse pressure, or the difference between diastolic and systolic pressures, there is much reason to believe, has a special significance. In this regard it is sufficient to refer to Erlanger's case of orthostatic albuminuria and to the experiments of Mall and Welch on infarct formation in the intestine. Another application of the Erlanger sphygmomanometer is seen in its use in the continuous determination of blood-pressures as used recently by Eyster in the study of Cheyne-Stokes respiration. The instrument is set so that the mercury reading is midway between the systolic and diastolic pressures when the oscillations due to the pulse are of medium extent. Any increase of blood-pressure would cause an increase in the height of the oscillations since the diastolic pressure would then be closer to the pressure in the instrument.

It is a well-known fact that food placed in the mouth leads to the appearance of a liquid, the saliva, which is a secretion of the salivary glands. It is the first of the digestive juices with which food is brought into contact and serves mainly in breaking down the carbohydrate food-stuffs. It is also a common experience that under certain conditions the mouth "waters," by which is meant that saliva appears in appreciable quantities without the ordinary procedure of actually putting food in the mouth. The thought of the taste of a lemon, for instance, will in many cases make the mouth "water." To distinguish the latter from the former it is called a psychical secretion. The thought of food, induced by the sight of a palatable morsel or of its mention, brings about an activity of the salivary glands by the passage of nerve impulses from higher centers of the brain to the secreting cells. It is to the credit of the Russian physiologist Pawlow that he was the first to make clear the usual participation of the psychical secretion in salivary secretion whenever food is taken into the mouth. He showed, furthermore, that there is an adaptation of the character of the saliva to the work which it has to do. Dry, solid food stimulates a large flow of saliva such as is necessary in masticating properly, while food containing much water excites but little flow. If a handful of clean stones is placed in the mouth of a dog he will move them around with his tongue for a while and then drop them, very little saliva being secreted. If the same material is given as fine sand a rich and abundant flow of saliva follows, a reflex evidently necessary in this case, otherwise the material could not conveniently be removed from the mouth. Such adaptations are special reflexes depending upon some difference in the nervous mechanism set into action, and the extent to which these adaptations are, at times, operative is surprising. Thus, in the experiment of putting pebbles or sand into a dog's mouth it was found that the same differences in the salivary secretion follow when it is merely pretended that they are thrown into the mouth. So, in general, with other processes concerned in digestion it has been found that they constitute minute detailed adaptations to the work at hand.

Contrary to a very general belief, the mechanical stimulation of the gastric mucous membrane by food lying in the stomach does not excite the gastric glands. During a meal the secretion is first started by the sensations connected with eating, by the odor, taste, sight, or thought of food. It is primarily a psychical secretion which is continued later by other processes taking place in the stomach. Some foods, meat extracts, meat juices, soups, etc., contain substances designated as secretogogues which are able to cause a secretion of gastric juice. Others, bread and white of eggs, have no effect of this kind at all. For these facts we are again indebted to Pawlow. Pawlow divided the esophagus of a dog in the neck and sutured the two ends to the skin of the neck so as to form two fistulous openings. All food fed to an animal in this condition passes down into the esophagus but reappears at the upper opening and is lost, not entering the stomach at all. The dog may eat a prodigious amount, experience the enjoyment of eating, but does not fill his stomach. This Pawlow calls a fictitious meal. Observation upon the stomach during this time reveals an abundant secretion which continues for some time after the stimulus (eating) has ceased. By proper operative procedures pure gastric juice may be collected, and this method of obtaining the gastric secretion stands in striking contrast to the older methods where the juice is collected, for instance, by swallowing a sponge tied to a string.

It is the preliminary psychical secretion that prepares for the continued digestion of foods, like bread and the white of an egg, which contain within themselves no active secretogogues. But the digestive changes brought about by the psychical gastric secretion yield secretogogues that by absorption into the blood probably maintain the activity of the gastric gland cells for some time. The white of egg introduced thru a fistulous opening into the stomach of a sleeping dog, or of one whose attention is purposely being distracted, lies there inactive and unacted upon. No psychical secretion is present, and consequently no secretogogues. But if the dog in any way is made aware of the presence of food a psychical secretion immediately sets in. It might be assumed by some that secretogogues act upon sensory endings in the mucous membrane lining the stomach. If so, the reflex must be thru intrinsic ganglion cells, since the effect is obtained after complete severance from the central nervous system. Edkins has recently suggested a more probable explanation. He has shown that decoctions of the pyloric mucous membrane made by boiling in water, acid, or peptone solution, when injected into the blood, cause a marked secretion of gastric juice. These substances when injected alone have no such effect, nor when the decoction is made from the fundic end of the stomach. Edkins therefore suggests that secretogogues, whether preformed in the foods or formed during digestion, act upon the pyloric mucous membrane and form a substance which he calls "gastrin," and this substance, after absorption into the blood, is carried to the gastric glands and stimulates them to activity. Many instances of this method of control have been found in the body and have led Starling to propose the introduction of a new term, hormones. This is a general term for such substances as gastrin, which, carried by the blood, control physiological processes in distant organs.

The labors of Pawlow and his pupils seem to show that the properties and quantity of the gastric secretion vary with the character of the food. The quantity of the secretion varies, other conditions remaining the same, with the amount of food to be digested. Different kinds of food call forth secretions varying not only as regards quantity but also in their acidity and digestive power. The secretion brought out by bread, tho less in quantity than that caused by meat, possesses a greater digestive action.

Pawlow is convinced that the secretion of the stomach on a given diet is not caused normally by general stimuli all affecting it alike, but by specific stimuli contained in the food or produced during digestion, whose action arouses the secretion best adapted to the food injested.

At this point it might be well to mention, parenthetically, the doubt which has been cast upon the existence of rennin, the enzyme which brings about the curdling of milk. Rennin has been found elsewhere than in the gastric mucosa, for instance, in the pancreatic juice and even in the tissues of plants. Wherever a proteolytic enzyme is to be found there can be found some evidence of a curdling action on milk. For this reason the view has been taken that milk coagulation is not due to a specific enzyme, but is an action of the pepsin.

Our views with reference to pancreatic secretion are likewise very much more complex than they were formerly. These later views had their origin in a discovery made by Dolinsky in 1895 that acids brought in contact with the inner lining of the duodenum are quickly followed by a secretion of the pancreatic juice. This occurs even when every nerve connection with the central nervous system has been separated. It is, therefore, the general belief that the hydrochloric acid of the gastric juice, in some way, starts the flow of pancreatic juice. Bayliss and Starling have succeeded in showing that an extract of the mucous membrane of the duodenum in 0.4 per cent hydrochloric acid when injected into the blood causes an active secretion of pancreatic juice. Neither acid alone nor an aqueous extract of the mucosa have this effect, so that it is believed the hydrochloric acid of the gastric juice upon its entrance to the intestine leads to the formation of a special substance, secretin, which, after absorption into the circulation, is carried to the pancreatic cells and excites them to activity. Secretin, like gastrin is not an enzyme. Both may be boiled without loss of their characteristic properties.

Another new discovery which complicates the action of the pancreatic juice may be mentioned at this point. It was found by one of Pawlow's pupils, Chepowalnikoff, that pancreatic juice obtained by means of a fistula has little, if any, effect in digesting proteins. As ordinarily obtained the pancreatic juice is, thru its ferment, trypsin, a most powerful proteolytic agent.

By some process the inactive trypsinogen or precursor of trypsin, after leaving the duct of Wirsung, is made active. It has been found that if the inactive trypsinogen is brought into contact with the mucous membrane of the duodenum it at once acquires active power in breaking down proteins. The mucous membrane, then, yields a body or substance which can be extracted readily, which converts the inactive into active trypsin, and since this substance shows the characteristics of enzymes, i. e. is an enzyme and activates another enzyme, "a ferment of ferments," Pawlow called it enterokinase. The value of this adaptation is perhaps to be found in the fact that the pro-enzyme, trypsinogen, is relatively resistant to injurious influences, and active trypsin is quite readily destroyed.

One other enzyme has been added to the list of digestive ferments, one discovered by Cohnheim in his attempt to find in the intestinal mucous membrane a ferment which would reconvert the split products of protein digestion into the characteristic proteins of the blood. Instead of finding such a body he established very clearly the existence of an enzyme which he named erepsin and which acts particularly upon proteoses and peptones, breaking them down into the still simpler amino-acids. The old scheme of proteid digestion established by Kühne, which set up in the proteid molecule two groupings which led respectively to the formation of an anti- and a hemi-peptone, is no longer thought to represent the true course of events. The separation into anti- and hemi-peptones, as is well known, lay in the fact that hemi-peptone was supposed upon further action of the trypsin to be broken into leucin, tyrosin, and other amino-bodies while anti-peptone resisted such disintegration. However, even pepsin-hydrochloric acid digestion will, if given sufficient time, lead to the formation of bodies simpler in structure than peptones, while trypsin and erepsin are very active in converting peptones to amino-bodies. Different views exist at present as to the extent to which this process is normally carried. In the minds of some observers the breaking-down of the protein molecules is complete. Abderhalden has recently suggested a more interesting view. According to this author the many amino-bodies, such as leucin, tyrosin, arginin, etc., are split off from the protein molecule, leaving behind a nucleus of the original molecule which serves as the starting point of the synthesis of a new protein, which is like those characteristic of the blood. This nucleus is a substance or a number of substances intermediate between peptone and the amino-acids and is called a peptid, a peptoid, or a polypeptid. This reconversion of the polypeptids and other split products into protein or, at least, more complex bodies, is attributed to the same agents that originally led to the breaking up of the proteid, namely, the enzymes like erepsin. For it is well recognized that the action of enzymes is, in many cases, reversible and the tendency is to make this peculiarity of action universal. This has been beautifully shown by Kastle and Loevenhart in the action of lipase upon the simple ester, ethyl butyrate. Lipase brings about a hydrolysis of the ethyl butyrate according to the following reaction:

$$C_3H_7COOC_2H_5 + H_2O \rightleftarrows C_3H_7COOH + C_2H_5OH$$

The double arrow combining the two members of the equation indicates that the reaction takes place in both directions. Not only does water combine with ethyl butyrate to form butyric acid and ethyl alcohol, but the latter bodies, when once formed, reunite with the formation of ethyl butyrate and water. As a result there comes about an equilibrium of reaction between the four substances in question which lasts as long as the conditions remain unaltered. A removal of one of the substances leads to a disturbance of this equilibrium with a consequent acceleration of the reaction in one or the other direction as the case may be, until a new equilibrium is established. In the digestion of fats, then, it is believed that the lipase of the pancreatic juice acts upon the fatty foods, converting the fat to a corresponding fatty acid and into glycerine. The fatty acid and glycerine are absorbed and get into the central lacteal or into the blood, where, under the influence of the same enzyme, lipase, they are reconverted to neutral fat. In this way can be explained the disappearance of a non-diffusible fat from the interior of the intestine and its appearance as neutral fat again in the blood, and it is believed that most, if not all, of the fat undergoes this process and is not absorbed in the form of minute globules as was the older view.

Exactly the same process of reasoning may be employed in explaining the synthesis of body proteins from the split products of digestion—polypeptids and amino-acids—and, with some modification, sheds light upon the constant presence of peptone (so-called anti-peptone) in a digestive mixture. The action of the proteolytic enzymes is reversible so that peptone is no sooner broken down into simpler bodies than these simpler bodies, or some of them, reunite to form peptone.

The existence of polypeptids is not so hypothetical as might be assumed. The work of Fischer of Berlin and of Curtius of Heidelberg in this first step in the synthesis of proteins marks probably the most important fundamental advance in biology in many years. The first insight into the composition of a protein molecule is obtained by splitting it up, which can be done by means of digestive ferments, by the action of boiling acids, superheated steam, etc. In this splitting, which is a hydrolytic change, there appear successively and simultaneously proteoses, peptones, and a variety of simpler bodies, amino-acids, which, twenty or so in number, differ markedly from the original protein molecule. Those which have been longest known are leucin and tyrosin. These are elementary components of the protein molecules from which the latter are built up. They are said to exist as such in the intact protein molecule, and the action of the hydrolytic agent lies simply in separating them from each other. An examination of their structural formulas reveals that each possesses an amino-group (NH_2) substituted for a hydrogen atom on the carbon nearest the acid radicle ($COOH$). The name amino-acids is derived from this fact. The rest of the radicle may be simple chains as in leucin, members of the aromatic series as in tyrosin, or may contain sulphur as in cystin. Each constituent of the protein exhibits strongly basic properties thru the NH_2 group and likewise thru the ($COOH$) grouping manifests strong acid properties. They unite, therefore, in indefintie numbers and owing to their great variety in an infinite number of combinations. Their artificial combination has been surprisingly successful. Glycocoll is one of the simplest of the amino-acids. A union of two glycocoll groups gives a substance designated glycyl-glycin. Glycyl-glycin is a di-peptid. It is possible to make two, three, four, five, six or more amino-acid molecules enter into combination with each other so as to obtain tri-, tetra-, penta-, hexa-, and poly-peptids. The following examples of such combinations may be mentioned: Glycyl-alanin, alanyl-alanin, glycyl-tyrosin, leucyl-prolin, leucyl-glycyl-glycin, tetra-glycin, dialanyl-cystin, leucyl-tetraglycin, etc. As these combinations of amino-acids become more complex they begin to exhibit the reactions characteristic of proteins. While the di-peptid glycyl-glycin and the tri-peptid tri-glycin give no biuret reaction, this is positive in the tetra-peptid tetra-glycin. Higher peptids, such as leucyl-penta-glycin, give a red biuret test which seems identical with some peptones. Phosphotungstic acid, which is used as a precipitant for the digestion products of proteins, will precipitate many synthetic peptids. Further, certain amino-acids having a sweet taste when banded together become bitter, thus resembling peptones. Finally, polypeptids are split into simple amino-bodies by the action of trypsin, which in view of the specificity of action of enzymes is very significant.

The breaking down of proteins, then, during digestion is much more complete than was formerly thought, and the experimental evidence at hand sheds more or less light upon the mysterious disappearance of the split products of digestion during absorption. This leads naturally to a consideration of the further history of protein food in the body. That protein is absolutely necessary to the maintenance of life was recognized very early and under the influence of Liebig's ideas was looked upon as the source of all bodily energy. Altho the celebrated experiments of Fick and Wislicenus later showed most definitely that in their mountain ascent the energy which they liberated was greater than could be accounted for by the proteid broken down and that the energy must, therefore, have been derived from other food-stuffs, yet in general the idea continued to prevail that protein is of pre-eminent value. Pflüger maintained that all protein injested was built into the living matter before undergoing disassimilation. Later, with the growth of increased detail of knowledge of metabolic processes, Voit proposed a second theory. A portion of the absorbed protein material, after passing to the tissues, is destroyed waste of the tissues and to provide new material for growth. This portion is designated as tissue protein and can not be replaced by non-nitrogenous food-stuffs. The larger portion of the absorbed protein material, after passing to the tissues, is destroyed under the influence of the activity of the living cells without becoming a part of the really living matter. This portion Voit called circulating proteid. While it can not be said that Voit's theory has been discarded, modern work, in yielding a greater insight into the details of protein metabolism, has given a truer conception. The trend of modern opinion may be summed up as follows. The split products of protein digestion are not entirely built up into the living tissue of the body. This is the fate of some of the material and very probably, as stated by Abderhalden, it is the more or less complex polypeptid that forms the nucleus for this synthesis. It is well known that many of the split products of digestion, like leucin and tyrosin, when circulated thru the liver are converted to urea, and since the products of protein digestion pass thru the liver, the possibility is open and probable that this is the fate of many proteins. It is believed that when the nitrogen has been removed the rest of the molecule, in many cases, remains as a carbohydrate residue which is subsequently oxidized and yields energy. Folin has lately shown that the proportions of the different nitrogen compounds in the urine vary with the amount of protein food. Upon a diet of 100 to 106 grams of usable protein the urea forms 87 to 88 per cent of the total nitrogen of the urine, while when the injested usable protein equals only three or four grams of nitrogen the urea forms 61 to 62 per cent of the total nitrogen. On the other hand, creatinin and the purin bodies are not altered in amount by such a change in diet. He assumes, therefore, that creatinin and the purin bodies represent the end products of the breaking down of living tissues and that the urea represents largely the protein food, most of which is converted to urea during the process of digestion and passage thru the liver.

The Value of Hospital Training for the Graduate of Medicine

BY PALMER FINDLEY, OMAHA, NEBRASKA

New hospitals are being created thruout the country; the old are being remodeled and enlarged. The demand for hospital accommodations for the sick and the injured is increasing daily. Nowhere is this more in evidence than in the city of Omaha and in the state of Nebraska. We have been sadly lacking in hospital accommodations. While good work has been done in our hospitals, there has been great embarrassment for want of good buildings and equipment. Happily these conditions will not long prevail, for we shall soon have hospital buildings and equipment equal to the demands.

Of what value will an interneship be in these hospitals? And I have particularly in mind the graduates of our local medical institutions. I will venture the assertion at the outset that there is no hospital, however small and wherever located, that is well managed and in possession of a medical and surgical staff of acknowledged ability, that is not worth a year or more of service in the capacity of house physician and surgeon. Furthermore, there is no graduate of medicine who can afford to forego the opportunity. I say this advisedly, because there is no substitute to compare with an interneship. Post-graduate courses at home and abroad, private practice in the city or country, and assistantships to able men—these have their value in their time and place, but not as substitutes for a hospital service. The logical order of events is an interneship immediately following graduation; this to be followed by special courses, assistantships and private practice. I have yet to see the man who regretted having had a hospital service, and I have been told repeatedly by men who threw away the opportunity for such a service that it was a serious mistake.

What are the values of an interneship? They are many.

First of all, the time spent in the service is one of whole-hearted and whole-minded devotion to scientific work, free from the countless distractions of private practice. Time is, therefore, utilized to the best advantage. Contrast the interne, who from early to late is at work in the wards, the operating room, the laboratories, and the dead-house, directed by men of experience and ability, with every facility at hand for the doing of scientific work, with the young graduate in private practice waiting for days, weeks, and possibly months for the opportunity that is the daily privilege of the interne. He has time in which to meditate on things, but too often they are not things of science, but rather of finance. The all-absorbing question is the ways and means of establishing himself on a safe financial basis. With the interne the passion is for the acquirement of experience in things medical and surgical; with the novice in private practice, it is of necessity largely the acquirement of a livelihood.

Again, we find the interne in a medical atmosphere. His every environment is an inspiration. It is but natural that he should grow and grow rapidly in his knowledge of medicine and surgery. He accomplishes his work with the least possible effort, and this lends encouragement and enthusiasm. Not so in the early years of private practice, or rather, may I say, in the years of striving for a practice. The disadvantages are great, for there is usually a painful lack of clinical material, and the equipment in library and laboratory is not equal to the demands of modern medicine. Furthermore, we find the young practitioner thrown upon his own resources, and while this has its advantages, these resources are often inadequate and would be the better if reinforced by those possessed by men of large ability and long experience. He gains self-reliance, but too often this self-reliance is bred of ignorance. That I may not be misunderstood, permit me to give an illustration of one way in which the unguided practitioner of medicine may gain self-reliance in ignorance. In the daily routine of his work he gives thoughtful consideration to the complaints of his patients; he makes his physical examinations with the thoroness of a conscientious worker, and he prescribes according to the indications as he interprets them. We will grant that his results are on the whole gratifying to him and his patients. Naturally he becomes more and more self-reliant as he gains confidence in his ability as a diagnostician and therapeutist. Is he justified in this self-reliance? How is he to know? There is no one of superior attainments at hand with whom to compare his findings and results, and above all the revelations of the laboratory, the operating room, and the dead-house are denied him. And so it is possible for the young practitioner to unconsciously develop the "ego" for want of opportunity.

In advising the graduating class to take interneships in hospitals before entering upon their life's work, all are impressed with the value of such a training, and while a goodly proportion accept the opportunity, there are those who feel, for one reason or another, that they must deny themselves of what they recognize to be a golden opportunity.

One says, "I can not take a hospital service because I must get out and make money; I am in debt." If such is his argument, let him remember that with the possession of a hospital training he will be equipped for greater work, and in proportion to the worth of his service so shall his reward be. In other words, he will be equipped for his work, and this will surely bring to him larger returns. I know of none so good an investment in time and service. But I would appeal to a higher ambition than that of money-making. If he is rightly inspired in his calling, he will value above all the self-consciousness that he is capable of giving to his patrons an honorable service. It is indeed sad to contemplate a life spent in the consciousness that the services rendered are inadequate.

Again the graduate says, "I can not take a hospital service because I am married." Here I am on dangerous ground, and I refrain from passing judgment beyond the venture of the statement that the sacrifice on the part of his helpmate will bring its reward.

"If I were younger I would take an interneship," says one of the older members of the class. Does he stop to consider that a hospital service will gain him years of experience; that in one year spent rightly in a good hospital he will gain the experience in medicine of many years in private practice? I have often thought that the older a man is at the time of graduation the greater is the need of hospital training, because it will greatly abridge his period of development.

Another will say, "I will go into private practice for a few years, save my money, and then take a post-graduate course." I am altogether convinced that this is a serious mistake. His years in private practice are not of equal value in experience to a service in the hospital, and his post-graduate courses, wherever he may take them, are a poor substitute for an interneship. We learn how to do by doing, not by seeing others do. This is the difference between a hospital service and a post-graduate course as they are commonly taken.

I will admit of but one valid excuse for declining a hospital service—that of poor health. The service is hard in proportion to its value, and unfortunately the food and ventilation of our hospitals are not always as they should be.

The College of Medicine of the University of Nebraska urges every member of the graduating class to take a hospital service immediately after graduating. Every student is given this opportunity, and if his service has been satisfactory to the faculty the degree of Doctor of Medicine cum laude will be granted him at the end of a year's service.

I hold that no student in the possession of good health can afford to reject this proffer.

THE BULLETIN
OF THE
UNIVERSITY OF NEBRASKA
COLLEGE OF MEDICINE

HENRY B. WARD, Dean, Lincoln **HAROLD GIFFORD**, Associate Dean, Omaha

THE BULLETIN is published quarterly in January, April, July, and October, by the University of Nebraska, at Lincoln, Nebraska

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Single numbers of the BULLETIN may be had for 50c each. Complete volumes or subscriptions by the year $1.00

All communications relating to THE BULLETIN should be addressed to
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EDITORIAL

Constantly there comes to our notice the comparative importance in medical work of the clinician and the experimentalist. To get at the bottom of this matter we ought to investigate our methods of procedure in all kinds of scientific work. For the scientist there are two implements at his disposal—observation and experiment. As long as we attempt to solve the problems of medicine by clinical experience only, we must depend upon but one of these implements—observation. For in clinical work the range of experiment must necessarily be limited. In other words, if we employ observation alone, we must be satisfied with what nature offers us, but if we employ both observation and experiment we may wrest from nature her secrets. In no field is this so aptly illustrated as in physiology. For centuries past, medical men have been observing physiological phenomena in health and disease, but no advances were made in solving the causes of the latter until two or three decades ago when the experimenter began his work, and now we are appalled by the extent of the knowledge which has been revealed. Furthermore, his work led to the experimental study of the cause of disease, which has given rise to bacteriology and experimental pathology. Thru the centuries, also, physicians have by observation attempted to find certain bodies which might be useful in the treatment of disease, and altho their recorded observations fill volumes they are of little value. It remained for the physiologist to show by experiment that certain chemical bodies which are the normal products of certain cells have an important and essential action in regulating and maintaining vital processes. And further he has shown us that other bodies, foreign to the organism, may be used for the regulating of certain functions. Thus he gave birth to pharmacology which is simply a department of physiology. The pharmacologist of today has increased and made rational our knowledge of the action of important drugs upon the physiological processes in the normal animal. There now remains to be solved a still more important problem of clinical medicine. We must devise some means to make the knowledge obtained by the pharmacologist of more certain value in the treatment of disease. This some have attempted to solve by establishing a clinical department in connection with the pharmacologic laboratory. But this plan is inefficient for here again we must rely upon observation. We may administer drugs to our patients and observe the results. But in the diseased condition the physiological processes are even more complicated than in the normal, and again we must take what nature offers us. But we can establish a laboratory of experimental therapeutics where not only the action of drugs but other methods of treatment may be investigated by experimental means upon animals in which a known diseased condition has been produced, and there is no restriction placed upon our methods of procedure as must necessarily be in the case of hospital work. This must and will be the policy of our University. It is evident, of course, that the busy clinician can not be the experimenter in the laboratory. But every medical student must go thru this process of development. His courses in physiology must be followed by courses in experimental pathology and pharmacology, and the latter must be rounded out by a course in experimental therapeutics. Then the student is in a position to reap the richest harvest when he enters upon clinical work.

R. A. LYMAN.

COLLEGE NOTES

Dr. E. D. Banghart, U. of N. '07, has located at Manley, Nebraska.

Dr. F. S. Owen recently returned from an absence of one month which, in company with Mrs. Owen, was spent in New York.

Dr. R. A. Lyman, the genial professor of pharmaco-dynamics, made a flying visit to Carthage, Missouri, during the holidays.

Dr. H. B. Ward has been elected a foreign member of the Russian Imperial Society for the Acclimatization of Animals and Plants.

Dr. F. J. Swoboda, '05, has located at Brainard, Nebraska, and is doing well. His wife presented him with a son and heir on November 9.

Dr. A. B. Kühe, '03, of Walnut, Iowa, went east for post work. Dr. Robertson, '06, substituted for him during his absence of two months.

Dr. Winfield S. Hall, professor of physiology and Dean of the Northwestern Medical School, while in Lincoln recently, visited the University.

The last speaker before the University Medical Society was Dr. H. J. Lehnhoff, who addressed the students on the "Diagnosis of Perforation in Typhoid Fever."

Dr. Frank E. Osborn, of Beatrice, Nebraska, has been appointed by the governor to succeed Dr. Johnson as superintendent of the Feeble Minded Institute in that city.

The marriage of E. Don Skeen and Ethel Haynes, Alpha Omricon Pi, both of the class of 1906, took place at the central church of Christ, Decatur, Illinois, December 24.

Dr. Herzog, while in Omaha recently, spoke before the senior medical students on a very young human embryo, and later addressed the Douglas County Medical Society on Plague and Beri-beri.

Dr. McClymonds, '03, of Walton, Kansas, was recently married. Returning from his wedding trip he stopped in Omaha long enough to visit a number of friends and his uncle, Dr. J. H. Vance.

Dr. H. A. Reichenbach, of Pender, Nebraska, has disposed of his practice to Dr. John Buis, a recent graduate of the Medical Department of the U. of N. Dr. Reichenbach will relocate in Council Bluffs, Iowa.

Dr. H. Winnett Orr gave a paper on the Causes and Treatment of Painful Affections of the Feet before the Lancaster County Medical Society and later before medical gatherings at Scotts Bluff and Tecumseh.

Dr. Wigton was married on December 19 to Miss Jessie Mosher, of Lincoln, and they now reside at the hospital, where he is first assistant physician. He is a graduate of the Omaha Medical College, class of 1905.

Dr. A. B. Somers has suffered from a severe illness which disabled him from work for a short time prior to the holiday vacation. He is so far restored as to be able to visit his office each day and expects soon to resume his teaching.

Dr. A. F. Jonas was married in Denver on November 16, 1907, to Miss Jessica Maud Stebbins. They departed immediately upon a tour of the Mediterranean countries, and are expected to be in Omaha again by the middle of February next.

Dr. H. H. Waite has been made president of the Lancaster County Medical Society for the present year. A banquet on June 14, given in honor of the retiring officers of the society, served also in celebration of the installation of the new officers.

Dr. Thos. Truelsen, of Omaha, Nebraska, and Miss Margaret Homeyer, of Council Bluffs, Iowa, were married in the latter city Saturday evening, September 14. They will be at home after November 1 at 31st and Leavenworth streets, Omaha, Nebraska.

Dr. E. N. Robertson, '06, late interne at Immanuel Hospital, Omaha, left during the holidays for Concordia, Kansas, where he is going to locate. Dr. Robertson received a bachelor's degree from the University in '04, and was associated with Dr. Gifford for five months.

Dr. H. M. McClanahan returned to his work in the College at the close of the vacation. He had been absent in Europe for a half year in study and recreation, being accompanied by his wife and daughter. He proposes in the future to devote himself exclusively to the practice of pediatrics.

Dr. I. S. Trostler, '04, formerly of Orleans, Nebraska, is now located in Chicago on the north side. He established himself in a settlement of Germans and is having much work. His address is 423 Garfield avenue. He was in Omaha a few days during the holidays to attend the funeral of his father.

A card has been received from Dr. David Isaacs, '03, who for the last two years has been abroad studying the eye, ear, nose, and throat. For eight months he worked in Glasgow, then in Vienna. At present he is working with Professor Axenfeld in Freiburg i/B, Germany. He has as yet set no date for his return.

A card has been received from Arkdale, Wisconsin, announcing the marriage there of Miss Elvena Isabell Lecy to Dr. Josiah S. Davies of the class of '03. Dr. Davies located in Granville, North Dakota, shortly after graduation and has built up a very extensive practice; in fact, his practice got too large for him, so that last fall he formed a partnership with his classmate, O. D. Platt.

The coming meeting of the American Medical Association will be held in Chicago, June 2-5, 1908. This year a feature of the meeting will be the alumni reunions of the different medical schools in the United States, all of which are to occur on a special night reserved for that purpose. It is especially our desire that the University of Nebraska College of Medicine make a creditable showing. To do this much harmonious effort will have to be put forth by those interested.

Dr. G. C. Shockey, 1902, of Melrose Park, Illinois, will be the representative of our College on the local committee of the A. M. A. All will recognize the peculiar fitness in the appointment of Dr. Shockey. More definite announcements will be made later, but now it is appropriate that alumni and faculty note the fact to avoid making conflicting engagements. Let us bring out the greatest attendance that the College has ever gathered at an alumni meeting.

Since the last issue of the BULLETIN the Pathological Club of the College of Medicine in Lincoln has been busy with its program. With few exceptions meetings have been held weekly, and before the end of the semester fully half of the program shall have been put into execution. Space forbids a description of the work in detail. To the members it is laborious, time-consuming but eminently valuable and even indispensable. It is essentially post-graduate work at a minimum expense save of time and energy.

Dean Ward has received from China, through the kindness of Dr. W. H. Jefferys, editor of the *China Medical Journal*, specimens of two intestinal worms which are of great importance in that country, with the request that a positive determination should be made of the species represented.

Dr. F. Creighton Wellman has also sent him a collection of parasites from Portuguese East Africa. It is expected that a report on these forms will be made to the American Society of Tropical Medicine at its annual meeting in March at Johns Hopkins University.

The following extract is taken from the *Daily Nebraskan:*

The Senior Medical class finished their election of officers today. They are as follows: President, D. B. Mullikin; vice-president, Clarence Rubendahl; secretary, B. B. Miller; treasurer, L. J. Kerr; sergeant-at-arms, J. B. Grinnell. J. C. Moore was elected associate managing editor for the Cornhusker. The Junior Medics elected O. W. Wyatt, president; C. D. Nelson, secretary; and H. L. Mantor, assistant business manager for the Cornhusker. Both medical fraternities have houses here this year. Phi Rho Sigma is at 1314 South Twenty-sixth street and Nu Sigma Nu is at 1509 South Twenty-sixth street.

December 18 Dean Ward went to Chicago on behalf of the University to participate in an official conference of college authorities and state boards with reference to conditions for medical licensure. The meeting included representatives of the Confederation of State Licensing, Examining, and Reciprocating Boards, of the Association of American Medical Colleges, and of the Councils on Medical Education from the various medical associations. Substantial progress was made towards the formulation of a workable plan to bring the states closer together and to remove petty obstacles which interfere with the movement of medical practitioners without at the same time affecting the real standards for licensure.

On this trip Dean Ward had the privilege of lunching with the Chicago Alumni Association of the University of Nebraska, and reported a most delightful noon hour spent in discussing University affairs with a generous bunch of old students.

There have recently been two special convocations for medical students of the College of Medicine in Lincoln, and it is the intention to hold others from time to time. Their management is in the hands of a committee of which Dr. Lyman is chairman. At the first meeting on October 31, Dean Ward addressed the students on matters of special importance to the College. It was the occasion of much surprise as to the number in attendance, for there is otherwise little opportunity to see all medical students congregated together. At the second medical convocation Dr. Maxmilian Herzog, formerly of the Government Laboratories in the Philippine Islands, spoke on "United States Medical Work in the Philippines." Dr. N. P. Colwell, secretary of the Council of Medical Education. A.M.A., also addressed the class. Both were guests of the Pathological Club during the evening when the Club was further honored by the presence of Dr. J. E. C. Sward of Oakland.

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VOL III APRIL, 1908 No. 2

THE BULLETIN

OF THE

UNIVERSITY OF NEBRASKA

COLLEGE OF MEDICINE

PUBLISHED BY THE UNIVERSITY

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ENTERED AT THE POST-OFFICE IN LINCOLN, NEBRASKA, AS SECOND-CLASS MATTER, AS UNIVERSITY BULLETIN SERIES XIII, NO. 10

THE BULLETIN
OF THE
UNIVERSITY OF NEBRASKA
COLLEGE OF MEDICINE

VOL. III *APRIL 1908* No. 2

Some Unusual Cases of Foreign Bodies in the Ear[1]

BY H. GIFFORD, OMAHA, NEBRASKA

It is not my purpose to amuse the society with a list of the botanical and zoological specimens which the aurist finds from time to time in the ear, but to describe four selected cases, two of which exhibit features which I have not seen elsewhere described, while the others are instructive to the general practitioner on account of the general principles which they illustrate.

CASE I.—A child of some three years was brought to me with the story that it had put two glass beads into the left ear; that the family doctor had removed one of these, but had not been able to get the other. An examination revealed a discharging ear with the meatus so occluded by swollen walls that no view of the drumhead was possible. A probe very carefully inserted touched a smooth, hard surface, feeling exactly as one would expect a glass bead to feel. An extraction through the meatus was, of course, not to be thought of, and as the ear had already been suppurating several days and the child was feverish and in pain, I decided that delay might be dangerous. Accordingly, the usual incision behind the auricle was made, and the membranous and cartilaginous lining of the meatus was turned out. This exposed the middle ear rather freely, as the drumhead was found to be nearly all destroyed. To my surprise, however, no bead nor any other foreign body was found. What I did find was the promontory of the labyrinthine wall so denuded of its natural covering that the probe in touching it gave an impression so strikingly like that which one would expect a bead to give that I was sure that this was what I had felt on my first examination. The ear was replaced, and suppuration rapidly subsided under the use of a peroxide boracic solution. Whether the child retained any useful hearing in the ear I can not say. The day after the operation another member of the family came to town, and from her I elicited the information that there had really never been any bead in the case; that the child had been playing with an old-fashioned ring and that a single small flat stone had come out of the setting and had been put into the ear. To account for the belief in the second bead in the ear I concluded that in removing the stone the doctor, a very bright, efficient man, had denuded the bone and had then been deceived by feeling this, as I subsequently was deceived.

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[1] Read before the Omaha Douglas County Medical Seciety, December 10, 1907.

Case II.—A boy of about three years was brought in with the story that some two or three months before, while playing with a sharp stick, he had fallen and run the stick into his mouth. Much blood had come from the mouth, and the mother was sure that a ragged wound could be seen in the back of the mouth. A week or so later the right ear began to discharge, and a little later a reddish growth protruded from the meatus. This was removed several times by the family physician and by a traveling specialist, but it kept returning. I found a mass of granulations surrounded with pus protruding from the child's right meatus. Accepting the mother's story, I explained the condition by assuming that the wound in the pharynx had caused an infection which had spread to the ear, and that the granulation polyps had developed from the neglected suppuration in the tympanum. Under chloroform I removed much of the granulation tissue, but at a depth of about three-fourths of an inch I came upon a foreign body which I removed only by exercising a good deal of force, with the aid of a Dench forceps. This proved to be a piece of stick about an inch long and three-sixteenths inch in diameter, rudely sharpened at the inner end, the outer end showing a rough fracture. The child had no bad symptoms after the operation. It was taken home in a few days, and I was told that the discharge ceased entirely under the peroxide and boracic treatment in the course of a few weeks. From the length of the stick and the depth at which the outer end was found it seems as tho the outer wall of the labyrinth must have been penetrated in this case, but I have had no opportunity of seeing the child again to determine what the condition of the hearing is. The case is a remarkable illustration of the fallibility of human testimony. The mother was ready to take her oath that the stick had entered the child's mouth and that she had seen the ragged wound which it caused there. What happened, undoubtedly, was that the stick plugged the outer meatus so tightly that blood from the injured middle ear, instead of coming out thru the meatus and calling attention to the ear, ran thru into the throat and gave rise to the belief in a wound of this region.

Case III.—A boy of ten got a grain of wheat into the left ear, and the family physician made a number of attempts to remove it, without success. Five days later the boy was brought to me with a purulent discharge from the left meatus and the walls so swollen that a view of the drumhead was not possible. Nevertheless, it was not difficult to remove the grain of wheat by moderate syringing. There was so much discharge that I hesitated about allowing the boy to go home at once, but he did so, continuing the use of the peroxide and boracic solution. Instead of getting less, however, the discharge increased with decided increase of the pain. I did not see the boy again, but he was seen about two weeks later by my colleague, Dr. Bicknell, who found an inflammation of the mastoid with great pain, tenderness, and swelling, and a temperature of 103. Dr. Bicknell did the ordinary mastoid operation, finding the cells highly congested and containing granulation tissue, but no distinct foci of pus. The boy made a speedy and perfect recovery. There is nothing especially novel about this case; it is reported simply as a typical example of mastoiditis following attempts at removing an unoffending foreign body from the meatus. Such cases are reported nearly every year, and a fair proportion of them end fatally.

Case IV is reported as a joke on myself. The patient was a woman of about thirty-five years who, six weeks or two months before coming to me, had got the glass head of a pin into the left ear. A number of attempts had been made by other physicians, including at least one aurist, to remove the pin-head without success. I found the upper edge of the pin-head plainly visible at the bottom of a large perforation in the drumhead thru which it evidently had been pushed in the efforts to extract it. There was no discharge, and it looked as tho it would be easy to remove it. I told the patient so, but she shook her head as if she had been told that before. She had been hurt so much by previous work that she insisted upon having a general anesthetic if any instruments were to be used. I first tried syringing, without result. Chloroform was then given and attempts were made to remove the pin-head with various instruments, without success. It was apparently about three-sixteenths of an inch in diameter and could not be grasped firmly with any forceps at my disposal. With a blunt hook or a curette it could be raised up and outward so as to be almost out of the tympanic cavity, but just at the critical moment the instrument would slip off and the bead drop back. After a few minutes of this sort of work the ear began to bleed, and I decided that it would be wrong to try to do anything more thru the canal that day. I informed the relatives that I was sure I could remove it if they could let me cut loose the ear from behind, and they said they would think it over. Their thoughts evidently were not favorable to me, as the patient never returned, and I know nothing of her subsequent history. If I were to see another case similar to this I should, before using any instruments, try the procedure recommended in nearly all text-books, but which I have never had occasion to use, which consists in carrying the tip of a camel-hair pencil or a fine cotton swab dipped in glue down to the foreign body, allowing it to become attached and then withdrawing both. A very little force would have sufficed to remove this bead, but it was impossible with instruments to apply it in the right direction.

In conclusion, let me give a few aphorisms regarding foreign bodies in the ear, most of them very, very old, but, as the experience of most aurists indicates, they are none too well known. First, in ninety-nine cases out of a hundred there is no hurry about doing anything. Most of the things that get into the ear will do no harm if left alone, even for years, beyond causing an occasional reflex cough. If the thing is alive, drown it with oil, vinegar, water, or some other liquid, and extract at leisure. Second, always try syringing before trying instruments. Third, unless you are experienced with the treatment of ear diseases *never* use instruments. Where a foreign body can be plainly seen in the meatus the temptation to reach for it with some sort of instrument is almost irresistible. This effort may be and doubtless has been, in countless cases, successful, but every now and then the first attempt merely pushes the foreign body a little farther in. The second attempt repeats this process; then the surgeon thinks that if he can try just once more he will surely get it, and this once frequently gets it beyond the reach of anything but a serious operation. If the attempts were to cease here still no great harm would be done, since the cutting loose of the auricle from behind is a comparatively innocent operation; but unfortunately the surgeon generally seems to feel that his reputation is staked upon the removal of the foreign body, and a continued repetition of the efforts at extraction are made until the foreign body is driven thru the drumhead and the hearing seriously injured or perhaps the patient's life lost. Fourth, do not be afraid to try to syringe out a bean, a grain of corn, or other vegetable substance with water. Many text-books advise against this for fear that the water will cause the seed to swell and become firmly impacted. The student is advised to use oil instead. I sometimes wonder how many of these authors have actually tried to syringe out a foreign body with oil. Where syringing is effective at all it generally is so within a few minutes, before the foreign body would have time to swell perceptibly, and if troublesome swelling occurs later it can be reduced with alcohol or with the galvano-cautery. Finally, do not feel sure that a foreign body is in the ear because the patient or his relatives are ready to swear that it is, even if you think you can feel it yourself.

The Treatment of Ileus[1]

BY BYRON B. DAVIS, OMAHA, NEBRASKA

When a case of ileus, "a symptom complex characterized by obstipation, abdominal pain, meteorism, and vomiting," presents itself, all due effort ought to be made to determine the obstructive lesion. At the very first all the usual sites of the external herniae are carefully examined and the rectum is explored. A history of the onset of the symptoms is obtained and all preceding conditions that might have a bearing on the case are inquired into.

Has progressive constipation been present, as is seen when there is gradual narrowing of the intestinal lumen from carcinoma? Does an acute inflammation exist? Has an operation been done for intra-abdominal abscess, pointing to anguiation from contracting adhesions? Did the initial pain point to any particular organ? Is local tenderness greatest in one region of the abdomen? Has the obstruction been absolute from the first? Has there been mucous or bloody discharge, or tenesmus? Can a mass be made out? Is peristalsis still active? These and many other questions must be elucidated as quickly as possible, since the knowledge gained in this manner may materially modify the line of treatment and will often determine the location of the incision. Whether all of these questions can be answered or not, one can usually ascertain with reasonable definiteness whether it is primarily dynamic or mechanical, and if the latter, whether it is a strangulation or an obstruction without strangulation.

Whatever the cause of the ileus, it may be laid down as an axiom that the pathology is increasing every hour relief is delayed. Realizing how rapidly death of tissue may occur when the circulation to a part is stopped by strangulation, and how equally effectually the blood supply to the bowel wall may be impeded and stopped when the intestine is greatly distended, resulting in ulceration—Kocher's dilation ulcer—with migration of toxins and bacteria thru the wall, it is not surprising that the mortality of ileus becomes rapidly higher the longer the operation for its relief is postponed.

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[1] **Read before the Omaha-Douglas County Medical Society, March 10, 1908.**

When operation is done early it is for the obstruction alone; later the toxic symptoms predominate and success can hardly be looked for without emptying the greatly distended intestines. The patient is much weakened from toxemia and possibly sepsis and in no condition to withstand a long and severe surgical procedure.

To illustrate the advantages of early over late operations, Rushmore collected the records of 301 cases operated for intussusception. One hundred and twelve were operated in the first twelve hours with only 12.50 per cent mortality; 136 in the second twelve hours had a mortality of 39.70 per cent; while of those operated after twenty-four hours, fifty-three in number, 68.90 per cent died. In the face of such statistics as these, the man who counsels delay should be designated by a more forcible adjective than "conservative."

An early operation for strangulated hernia is almost as simple and safe as an ordinary herniotomy. When postponed till the gut is gangrenous and toxemia is intense it becomes very formidable and is followed by an appalling mortality. The same is true of all obstructive lesions, and these points are emphasized particularly because it is no uncommon thing to see patients practically moribund, after days of complete obstruction, during which they have had administered to them all the approved cathartics in heroic doses. It is fortunate for these poor creatures that emesis is not denied them. This is a real picture, but fortunately is becoming less common as the years go by, and more and more early operations are being done with a very encouraging improvement in results.

In ileus, vomiting usually begins early, and the stomach keeps filling with the characteristic fluid, which pours into it from the small intestines as the result of the suction of the diaphragm and pressure of the overdistended intestine. The risk of an anesthetic when the stomach is full of fluid is increased many times; therefore the first step in the treatment should be to completely empty the stomach by syphonage.

Unless unduly delayed a general anesthetic is advisable. The man who gives the ether at such a time has a position of first importance. He should be an expert and only interested in his work. Everything should be ready to begin so that not a moment is lost, as I believe every unnecessary minute added to the period of anesthesia increases the risks.

If a definite diagnosis has been made of an obstruction at one side of the abdomen, the incision made directly over that point will make the work easier and more expeditious. Usually the exact location is not certainly known until the abdomen is opened, and under these circumstances it is far better to make the incision in the median line below the umbilicus, since through this opening good access is obtainable to most regions of the abdominal cavity. Make the incision long enough to work through. I am satisfied that much greater traumatism is inflicted thru an unduly small opening than thru a large, and a few inches added to the length of the incision is of no consequence. If by any chance the obstruction to be dealt with is so remote that it is not accessible thru the median incision, it can now be located with exactness and a second incision made over it with little loss of time.

The first aim when the incision has been made is to find the obstruction, if it has been diagnosed beforehand. Even without accurate diagnosis in advance the seat of the lesion is sometimes apparent the moment the abdomen is opened. But in most cases a mass of distended intestinal coils crowds up into the wound, greatly embarrassing the search. When this happens one of two courses is open: first, and a method which seems to be gaining in popularity, is to bring up the coil that first presents, protect all other coils with large compresses wrung out of hot normal salt solution, and open the exposed coil by a longitudinal incision half an inch long, pass into the lumen a good-sized glass or rubber tube, and protect from leaking by grasping the place of entrance of the tube with a strip of gauze. Coil after coil of the intestines is now slipped over the tube, the gas and fluid pouring out through the tube, after the procedure of Monks. It is possible in this way to pull six to eight feet of intestine over a six-inch tube. As soon as all possible has been emptied thru this incision the tube is withdrawn and the bowel sutured. If there still remains enough distended intestine to be troublesome, this procedure can be repeated once or twice until the intestines are collapsed sufficiently to allow an unimpeded search for the obstruction.

Three fingers or, if necessary, the entire gloved hand may now be introduced into the cavity for a careful systematic search. The work should be rapid, but not hurried. The ileo-cecal valve may first be sought. If the cecum is distended the obstruction is in some part of the large bowel, and the sigmoid should be examined. If found distended, the obstruction is in the rectum; if collapsed, look for the obstruction in the colon between the cecum and sigmoid. If, on the other hand, the cecum is collapsed, it shows that the obstruction is in the small intestine. Collapsed small intestine can almost always be found in Douglas cul-de-sac, and the hand may be passed down and grasp an empty coil. The collapsed small bowel is now gently but rapidly passed thru the fingers till the obstruction is reached.

The second method of search for the obstruction is to pursue the method just described before emptying the dilated coils. It is much more difficult and uncertain, since the distended coils seriously impede the search. It is also very easy to abrade the dilated bowel of its peritoneum and perhaps cause a leak at some point where the mucosa and muscularis have been devitalized. In carrying out the search it is highly important that the greatest gentleness be used; the penalty for rough handling is too great. Pinching and bruising of the intestines are bad enough at any time; with the conditions present in ileus they are intolerable. It it also highly important that there should be the least possible amount of exposure of the intestines during the procedure, only a short loop being visible at one time, the remainder being protected by towels or large pads wrung out of hot normal salt solution, and kept hot all the time. When the point of obstruction is found it is important to lose no time in deciding what is to be done, and acting on the decision promptly. Should a fibrous band be found, under which a loop of bowel has caught, it is not enough to cut the band; it should be ligated at both ends and the intervening portion excised. If adhesions have caused a kink or sharp angulation, free the adhesion and endeavor to leave it so that adhesions will not form again. This may be done by covering in the raw surface with peritoneum, or the raw surfaces may be so placed that they will not come in contact. If the obstructing cause is a hernia into one of the intra-abdominal fossae, it should be reduced gently, and the bowel inspected to ascertain if any damage has been done. Then by means of a few stitches of catgut the fossa may be so closed as to prevent a recurrence of the trouble. If a volvulus is present, the wall of the bowel should be inspected carefully, as sometimes the interference with the circulation has been sufficient to have caused gangrene and resection may be necessary. If the bowel wall is intact it is not sufficient to replace the coil; it is usually necessary to hold it there by means of a few stitches. Emil Reis has shown that in volvulus of the sigmoid, where it is usually found, the condition is often brought about by an old meso-sigmoiditis, with thickening and stiffening and shortening of the meso-sigmoid from old inflammation, with resulting contracting scar tissue. In these cases the whole length of the meso-sigmoid is sutured to the lateral and anterior abdominal wall in such a manner as to render the occurrence of volvulus impossible.

Should the ileus be found to be due to carcinoma of the bowel too advanced for successful removal, the formation of an artificial anus at the nearest possible point above the disease is the only choice. If the conditions are such that a resection offers fair promise of cure it should be done at once if the patient's condition will warrant so serious an operative procedure. Unfortunately, my experience has usually been that this class of cases, not usually presenting as grave symptoms at the beginning as the more acute obstructions, do not come to the surgeon until the condition is anything but favorable for an immediate resection. Altho the single complete operation, relief of the obstruction and excision of the carcinomatous gut, comes nearer the ideal to be aimed at, I would rather form an artificial anus for temporary relief and do the resection of the bowel as soon as the condition of the patient warrants than run too much additional risk in an effort to do all the work at once.

There are many reasons for deferring the resection, if the obstruction has been complete for very long and the dilatation of the coils above the obstruction is great: first, the fact that the patient is in too poor a condition to bear so serious and so prolonged an operation; second, union between the collapsed bowel below with the distended bowel above is difficult and uncertain; third, a secondary operation can be done with greater deliberation and more thoroness because the patient's condition is likely to be more favorable.

In cases of extreme distortion of the intestines, due to healed tuberculosis or to contracting scars from old ulcers, if the obstruction does not involve more than a few feet, it is often possible to make a choice between resection of the involved portion and a lateral anastomosis between the intestine immediately above and below the portion containing the obstructing lesion. The same line of reasoning may be followed here in deciding whether the resection or lateral anastomosis should be made as a primary operation, or that preceded by an enterostomy, as in the case of obstruction from carcinoma. It must be borne in mind that the higher in the small intestine it is necessary to drain, the less is the probability of the patient's nutrition being enough to put him in condition for a secondary operation.

Before entering on the discussion of the surgical treatment of ileus due to intussusception, I want to enter my protest against the too vigorous, too prolonged, too fashionable efforts to cure intussusception by means of hydraulic and air pressure. Altho admitting that one or two careful efforts by these means very early may be permissible and may occasionally give relief, prolonged efforts, especially after the first few hours, ought not to be tolerated. The suffering inflicted by the Spanish inquisitors was only in the first degree as compared to the tortures practiced often by well-meaning physicians upon the little innocent victims of intussusception. In this condition parts of the bowel may die very early from total absence of the blood supply, and the harm of forcible efforts to reduce may render hopeless a condition which could almost certainly have been successfully dealt with surgically. For some years I have made a rule never to use taxis in strangulated hernia until the patient is anesthetized and everything ready for an immediate operation, and then to apply the taxis with the utmost gentleness. I am almost convinced that the first step in the treatment of intussusception should be to get everything ready for an operation, anesthetize the patient, and then carefully inflate the bowel with air or water; unless the mass immediately disappears the abdomen to be opened.

In no form of obstruction does delay work more havoc than in intussusception. Think of it! During the first twelve hours only twelve per cent mortality. Allow twelve more hours to be wasted and the mortality rises to almost seventy per cent, nearly six times as great. Then think of the futility of the delay! I would like to know how many cases of intussusception not reduced during the first six hours, under the ordinary non-operative methods, yield to treatment during the next twenty-four hours.

Another important reason for promptness in intussusception is the extremely favorable conditions which surround the early operation: first, the child is not exhausted; second, the coils above the seat of obstruction have not had time to become greatly dilated and perhaps their integrity destroyed; third, toxemia, if present at all, is yet in a very mild degree; fourth, adhesions have not had time to form between the intussusception and the intussuscipiens, and the invagination is easily and quickly reduced; fifth, very early radical measures ought to be almost mortality free.

The steps of the early operation for intussusception are an incision in the median line and reduction of the invagination by pushing from the lowest part of the tumor, gradually working the invaginated portion out by gentle squeezing at the apex of the intussusception, following the apex upward as it recedes in the process of reduction. When complete, a few sutures may often be advantageously placed to prevent recurrence by holding the long ascending meso-colon to the peritoneum of the right side. If the intussusception is not reducible it may be resected, but this is a very formidable procedure, especially in infants, and a simpler method is that devised by Barker. He sutures the intussusceptum to the intussuscipiens at the base or where the invagination begins above. This is a continuous sero-muscular stitch, and at present I would prefer Pagenstecher's linen as the material. Barker then splits the intussuscipiens from this line of suture downward for about two inches, draws out the intussusceptum, and cuts it off as near as possible to the line of sero-muscular sutures described. The ends remaining are sutured with a few thru-and-thru stitches, and the slit in the intussuscipiens is closed. In infants the formation of an artificial anus, even in the extremely bad cases, is scarcely to be recommended.

There is still another class of cases of ileus so septic and so exhausted, with weak heart, subnormal temperature, cyanotic extremities, pinched features, that only the least possible operative manipulation is to be thought of. Here a little cocaine may be infiltrated along the skin incision, a short incision made, the first loop of distended bowel that presents sutured to the abdominal peritoneum, a purse-string suture introduced in the presenting surface of the bowel, a small incision made, and a rubber or glass tube introduced into the lumen and tied in by means of the purse-string. The gas and toxic fluid may thus be evacuated, and altho this procedure is applicable to a class of very unpromising patients, it occasionally results in relief of the toxemia; they may be nourished and built up for a few days until in condition for the more radical procedure of relief of the obstruction.

True dynamic ileus is usually due to general peritonitis. Altho with the aid of Fowler's position and the contributions of Murphy, who adds the use of normal salt solution injected per rectum very slowly and without force, general peritonitis is no longer the surgical bugaboo it was, advanced peritonitis with absolute paralysis of the intestines is a well-nigh hopeless condition. Even in these cases, when the volume of the heart is not too small and the patient has fair strength there is no harm in making an effort. In such a case two procedures are of the utmost importance. One is emptying the intestines after the method of Monk with a tube, or the formation of an artificial anus, or the permanent use of the tube as so ably advocated by Dr. J. E. Summers of this city. In addition to this the lowest part of the pelvis should be drained with a tube of large caliber kept pumped out by means of a suction syringe or by syphonage. The stomach should be kept empty in these cases by the frequent use of the stomach tube. The operation should be most rapid.

Post-operative ileus is usually the ileus of peritonitis, tho this is not always true, since kinks from adhesions or strangulation by bands, and sometimes, when gauze drainage has been made use of, pressure on a loop of bowel may shut off its lumen. The most important treatment of post-operative ileus consists in prophylaxis by care during the operation. Care in asepsis, proper drainage when necessary, and protection of the intestines during prolonged operations by means of hot normal salt pads, and abstaining from all rough handling. Should a post-operative ileus occur it is to be treated promptly and in accordance with the principles already laid down.

As regards the after treatment of cases that have been operated for ileus a few general principles are important. Because of peritoneal infection or the extreme liability of peritoneal infection no mistake will be made in treating these cases as if peritonitis already existed, using lavage of the stomach when indicated, ice over the abdomen, the Fowler position, and a constant small stream of normal salt solution kept flowing into the rectum. As a rule under this treatment, if the obstruction has been relieved and the distended intestines fairly well emptied, the bowels will move spontaneously within a few hours. If not, a mild laxative combined with a compound enema, is likely to prove satisfactory. A very effective method of administering a cathartic in these cases, if they are still nauseated, is to wash out the stomach, and before withdrawing the tube pour in a saturated solution of epsom salts or some castor oil. Given in this manner it is usually retained and often is followed by the best of results. Strychnia in these cases, given in moderate doses, serves the double purpose of stimulating the heart's action and adding to the power of the muscular coats of the bowel. Strychnia should always be used in moderation, as the large toxic doses sometimes given not only make the patient restless but often fill the veins at the expense of the arteries and thus do more harm than good. Food of all kinds should be interdicted until the bowels have moved nicely; then mild liquids may be begun carefully, to be followed by semi-solids and later solids.

TO RECAPITULATE:

1. Operations for mechanical ileus should not have a high mortality. The very high mortality of the past has been due to late operations.

2. Before operating for ileus washing out of the stomach should never be omitted.

3. The work should be done rapidly and gently.

4. Not too much should be attempted. Two or more operations with a live patient to show for them will always be better than one too-zealous operation followed by death.

5. When the coils of intestines are greatly distended, they should always be emptied of their toxic contents as completely as possible.

6. Resection of the bowel, when that is required, should not be undertaken at the primary operation unless the condition of the patient warrants it.

Clinical Manifestations of Ileus[1]

BY A. F. JONAS, OMAHA, NEBRASKA

A group of clinical signs produced by acute intestinal obstruction, manifested by severe pain, great prostration, and often vomiting has been designated as ileus. The term may be a very definite one, since ilium has derived its name from the Greek, eilein—(to twist) and it would appear that ileus means a twist in some portion of the ileum, but the findings in a given clinical picture, indicating acute intestinal obstruction, vary with each individual case. We discover, for example, that an acute bowel obstruction due to a twisted or knotted condition is called a volvulus; an acute bowel obstruction dependent on an adhered loop of ileum causing a kinking, as angulation; and acute bowel obstruction due to an actual twisting of a loop of ileum as a torsion of the bowel; and so on to the end of the list of acute bowel obstructions. We soon discover that a diagnosis, "ileus," gives us no accurate pathological idea of the cause for the important clinical appearances, namely the acute bowel obstruction. The term undoubtedly first came into use from an observation that the majority of acute bowel obstructions were found in the ileum and had no reference to the exact local conditions. Since the tendency to a more accurate nomenclature that states the actual findings, the term ileus has become an unfortunate one, and in the writer's opinion should be dropped and be supplanted by the more rational but perhaps not altogether accurate one of acute bowel obstruction. The term ileus has been in common use in Europe and of recent date has been more frequently employed in America.

We will use the name ileus as a synonym for acute bowel obstruction and will make use of the classification advocated by Murphy:

1. Adynamic ileus, meaning all those acute conditions wherein there is an absence of the powers of propulsion.

2. Dynamic ileus where excessive contraction of the muscular wall causes obstruction.

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[1] Read before the Omaha-Douglas County Medical Society, March 10, 1908.

3. Mechanical ileus where the fecal current is obstructed by a closure of the intestinal lumen by some mechanical cause.

Under the head of dynamic ileus we have a condition of a total absence of normal peristalsis due to a paralysis of the intestine, paretic or spasmodically stenosed. (Cannon and F. T. Murphy.) According to Bayliss, Starling, and Magnus, true peristalsis is a coordinated movement due to a local reflex which has its seat in Auerbach's plexus. While the intestinal canal can perform its motor functions for some weeks when wholly disconnected from the central nervous system, yet, according to Magnus, all reflex movements cease when Auerbach's plexus is removed. Therefore any injury to this mesenteric plexus would result in a cessation of peristalsis.

Cannon and Murphy have observed inhibition of gastric peristalsis during emotional excitement when the only connection between stomach and central nervous system was the splanchnic supply. Strong impulses thru the splanchnic nerves, therefore, may be regarded as a cause of gastric and intestinal inactivity.

From these observations one would conclude that a cessation of peristalsis is due to inhibitory impulses thru the splanchnic nerves, as during operative procedures, injuries to the mesenteric plexus, or a traumatism to the intestinal muscular structures. It would appear that dynamic ileus may be due either to a disturbance of the central nervous system or it may be local in a defect in Auerbach's plexus or in the structures which that plexus controls.

General asthenia may sometimes be responsible for a total cessation of the motor activity of the digestive organs. Splanchnic reflexes may be responsible for dynamic ileus. Nothnagel reported a case resulting from inflammation of an undescended testicle, and he adds that inflamed hydrocele, contusions of the testicle, operations for piles and suppurations in the abdominal regions have produced symptoms of occlusion of the intestine. Kocher, on the other hand, is inclined to differ from these views and states that, instead of ileus being a functional disturbance, it is little mechanical obstacles that lie at the bottom of the majority of cases of so-called dynamic ileus. Cannon and Murphy demonstrated experimentally that reflex dynamic ileus does exist.

They etherized male cats for a half hour, then crushed the testicle, and found total absence of peristalsis for more than four hours; while etherized cats, where the testicles were not crushed, intestinal movements continued uninterruptedly. It has been shown that the splanchnic nerves reflexly inhibit peristalsis. This was proven in cases where the splanchnics were cut on both sides of the body. In animals with only crushed testicles there was abolition of peristalsis for four hours; in animals with cut splanchnics and crushed glands, peristalsis continued normally. These experiments seem to show that "ileus paralyticus" can be caused without mechanical changes in or about the intestinal wall, but that the condition is one of inhibition, an inhibition conveyed to the stomach and intestines thru the splanchnic nerves. These same experimenters showed that etherization, exposure to air, and unusual cooling under aseptic precautions produced no appreciable effect. But most striking effects were produced after handling. Even the gentlest handling under irrigation with warm salt solution produced stoppage of peristalsis for fully three hours.

When organs were removed from the abdomen and handled gently, all movements were retarded. In one case the retardation was so great that food did not pass from the ileum to the colon for twenty-four hours. The retardation increased in direct proportion to the handling of the gut. The effect from manipulation after cutting the splanchnic was the same.

We can see that in any case of dynamic ileus a distinction must be made between the inactivity due to inhibitory impulses dependent on local disturbances in the gastro-intestinal wall and to like results dependent on general or central changes.

So much for dynamic ileus, a condition that concerns all practical surgeons and one that must not be lost sight of in post-operative conditions that confront us not infrequently. Our efforts should lie in the direction of prophylaxis, for it is not difficult to see that reflex ileus, both of central and of local origin, is difficult to manage successfully. This condition is usually brought about by peritonitis, traumatism, sepsis, reflex irritations, spinal lesions.

In *mechanical ileus*, we are confronted with mechanical conditions, where the intestinal obstruction is due to some physical interference with the intestinal current. In this class are usually included such conditions as bands, points of adhesion, tumors, stricture, invaginations, intestinal kinking, torsion, and sometimes strangulated hernia of many varieties, including diverticula, intussusception, fecal impaction, enteroliths, gall stones, slits in the mesentery and omentum, and intestinal looping. It will be seen that to discuss these manifold and varying conditions, will lead us beyond the bounds of this paper. It therefore seems most appropriate at this time to confine ourselves to post-operative acute bowel obstructions or acute post-operative ileus.

Twenty-five and more years ago it was of common occurrence to diagnose an acute appendicitis as ileus, but recent experiences along these lines have shown the fallacies of these early opinions, for they were only opinions. It was very seldom that these diagnoses were verified by *sectio in vivo* or *sectio post mortem.* Consequently they stood, and we of the younger generation groped about trying to find our way out of the darkness into the light, where we might become helpful instead of floundering about helplessly when we felt that something ought to be done. Now we seldom have acute ante-operative ileus; it is nearly always post-operative.

When, after a clean operation, we find that we are unable to bring about a bowel movement, and we can eliminate sepsis, the probabilities are that a traumatism may be the etiological factor. We have all known many cases with preexisting septic foci with an acquired immunity and no bowel disturbance; and in other cases with simple operations, with clean abdomens, before immunity has been established, an intense septic ileus develop.

In a given case, where we have completed an intra-abdominal operation, we may find a moderate distention beginning in twenty-four hours, which is unrelieved by the usual remedies, neither flatus nor feces being expelled; the condition is worse in forty-eight hours and becomes more severe to the end of the third day. Still unrelieved on the fourth, the abdomen becomes tensely distended, the respirations forty to fifty per minute, the pulse rapid, small, wiry, 140 to 150 per minute; the temperature may be 104-105; a cold clammy perspiration covers the entire body, the patient is extremely restless; the facial expression is one of fear, the eyes wide open, pupils dilated, the hands cold and icy, frequent emesis or gulping of a dark material, sometimes of a fetid odor, but no flatus or feces from the bowel. Do you recognize the underlying cause? It is plainly bowel obstruction sometimes termed ileus; obstructive paresis due to dynamic causes, possibly sepsis; or obstruction due to mechanical causes, owing to the adhesion of a loop of intestine to the line of incision perhaps, or possibly to a broad ligament stump; or to a raw peritoneal surface caused by the separation of an adhered neoplasm or intestinal loop; or the adhesion of one loop of intestine to another, all of these producing an acute angulation or kinking. Or we may have newly developed adhesion bands compressing or twisting an intestinal loop. In brief, there exists a complete obstruction to the intestinal current. Intestinal contents, gas and feces, accumulate above the point of obstruction, the bowel becomes distended and presses against the diaphragm. The distention is of greatest moment, for it has been shown that the profound depression of all the distressing clinical features in the advanced and later stages of this affection are due to an absorption of the toxines which have penetrated the intestinal wall, causing the peritonitis in the region of its passage. If the seat of obstruction was damaged by operative traumatism, this phenomenon takes place early. The seat of obstruction may be only hyperemic or it may contain infarcts, ulceration, and not infrequently gangrene.

The clinical features which may lead to a correct interpretation of the underlying pathologic conditions, are, in the writer's experience, briefly outlined herewith. First, abdominal distension and the inability to obtain a passage of flatus or feces. It has been our experience that this distension begins either in the lower part of the abdomen, which may mean intestinal distension and may be due to intestinal kinking. If we now recall the pathology which necessitated the operation, we may, where adhesion surfaces were large, suspect post-operative adhesions, causing angulation. Should we now, as we sometimes do, have more or less pain in the locality of the preoperative pathology, especially if that pain is paroxysmal and moves toward and stops at the site of operation, we can say with a great deal of assurance that we have a post-operative mechanical ileus. This condition may develop before the pulse, temperature, distension, and other severe features become alarming. The writer has seen several cases in which the severe paroxysmal pain was the predominating feature in the case. The pains appeared at longer and shorter intervals, sometimes associated with marked rumbling, and when listened to with a stethoscope the gurgling always stopped at the same point. The obstruction was located in three of our cases by ausculation, and the diagnosis was verified and relieved by operation. In one case where a diagnosis was made solely on the above findings and an operation refused, the correctness of the condition was shown post-mortem.

Continued post-operative vomiting is a disquieting symptom and may be a runner of a developing ileus. If we inspect the abdomen we find the greater part of the distension, sometimes nearly all of it, is in the epigastric region. All attempts at catharsis only aggravate the trouble. Vomiting is frequent, sometimes projectile, sometimes a frequent gagging, and occasionally frequent gulping of mouthfuls of dark fluid. Careful palpation and percussion seem to indicate an over-distended stomach. The introduction of an esophageal tube brings up one or two pints of fluid; the abdomen collapses, the distention has vanished, and often flatus is expelled per rectum after a simple injection. What was the cause of all the distress? The stomach had become over-distended perhaps by a reversed peristalsis dependent on a dynamic ileus, or possibly on both. The enormous gastric distension either compressed an intestinal section or brought about a reflex dynamic ileus, all of which were relieved by emptying the stomach.

Sometimes there is increased peristalsis above the point of obstruction, which is evidenced by increased borborygmus.. In one or two cases the peristalsis could be seen through the very attenuated abdominal walls.

Sometimes there is flatness or dulness on percussion over the point of ileus, especially if the operation was done for an exclusive localized infection.

While the foregoing are early symptoms the more profound manifestations soon appear.

Vomiting usually begins in one or two days. Sometimes the very first symptoms may be a rejection of the stomach contents and may precede the pain. The vomitus at first consists of stomach contents, then intestinal fluids colored by bile, later it becomes brownish, and finally fecal vomiting may be established. The pulse becomes rapid, the temperature rises. The patient finally presents a condition of shock, and he is free from pain owing to septic intoxication. Blood examination may and usually does show a leucocytosis, but it is no determining factor. Indicanuria, when present during the first two or three days, is contributory evidence in recognizing an intestinal occlusion, especially when due to peritonitis. Examination of feces, even when obtained, assist us very little.

In the light of a fairly extensive experience in abdominal surgery, the writer has learned that it is often difficult to distinguish between a dynamic and mechanical ileus, but that one can determine with a fair degree of accuracy many cases wherein the fecal current has been stopped by mechanical causes. When presented with a case of post-operative bowel obstruction where paroxysmal pain, especially if localized, is a prominent feature, particularly where there is active local or general borborygmus, a recurring peristalsis that seems to cease at a given point, as can be determined by a stethoscope and sometimes can be seen thru thin abdominal walls, and when the movement of intestinal gases can be heard by the unaided ear, a mechanical ileus is more than probable.

When an operation is followed by obstinate bowel obstruction that can not be relieved by the usual means, when such an obstruction is manifest, by the general abdominal tenderness and pain, an absence of local tenderness, an increasing tympanitis, an absence of all peristalsis, with elevated temperature, an increased pulse rate, a restlessness of the patient, an anxious and distressed facial expression, we are quite certain that we have to deal with dynamic ileus.

The Diagnosis and Treatment of Dilatation of the Stomach[1]

BY A. O. PETERSON, OMAHA, NEBRASKA

The nomenclature of gastric functional diseases is subject to considerable variation. This is undoubtedly due to the fact that there is no constant anatomical lesion on which a rational classification may be based. Hence it is impossible to invent a term which will cover all the phases or types of motor and mechanical insufficiency. The one constant sign is impaired motility; the stomach does not empty in normal time. Hence motor insufficiency would probably be the best term with which to characterize these numerous symptoms. But motor insufficiency is simply a functional sign; it designates merely a condition, a lack of emptying power. And often the stomach itself is not at all at fault in the causation of the trouble; e. g. in the case of pyloric stenosis, the stomach is simply worn out trying to overcome the resistance offered by the obstruction.

The most striking objective sign of motor insufficiency—a condition frequently met with by the general practioner—is the dilatation which the stomach has undergone. This dilatation is not a disease of itself, but is the result of other etiological factors either local or general. The various causes entering into the formation of gastric dilatation are: 1, obstruction to the evacuation of the gastric contents into the intestines; 2, deformities and adhesions of the stomach; 3, displacements of the stomach; 4, myastenia gastrica, which is but another term for muscular insufficiency and is a very potent factor in the production of dilatation.

This varied etiology leads us to believe we should not at present discard the word dilatation from our terminology even tho it contains no precise meaning in itself; hence the title of this paper.

Based upon the idea that motor insufficiency is the constant symptom of gastric dilatation, Riegel and Boas have constructed a classification thus: 1, simple gastric atony, or motor insufficiency or myasthenia without dilatation; 2, atonic dilatation (motor insufficiency due to relaxation of the gastric walls) without pyloric stenosis; 3, secondary dilatation (motor insufficiency due to pyloric stenosis).

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[1] **Read before the Omaha-Douglas County Medical Society, April, 1908.**

Simple gastric atony should be classified as a distinct disease, for here there is no change in the form or shape of the stomach. The viscus does not empty completely between meals, but does empty overnight. The trouble is usually due to some extrinsic cause, as overwork, worry and general nervousness, tuberculosis, anemia, gastritis, etc. The prolonged presence of food in the stomach may lead to a dilatation as well as to the subsequent or coincident production of supersecretion, continuous secretion, catarrhal gastritis, etc.

It shall be our purpose to discuss gastric dilatation not due to mechanical obstruction, giving but brief mention to this latter type of gastrectasia. Gastric dilatation is characterized by three conditions, viz.: 1, the stomach has become larger; 2, it does not completely retract when empty; 3, it does not completely empty itself during the twenty-four hours.

A stomach which has lost its tone and elasticity and its power to retract when empty is a dilated stomach. The normal stomach may be large or small, and its size may have no relation to its motor sufficiency. But a stomach in gastric dilatation is larger than the stomach normal to that individual.

In the morning, if the tube be passed into the stomach of a person suffering with dilatation, a variable amount of chyme in a state of decomposition can be aspirated. Also, on distending the stomach with air or gas, by inspection, or better by auscultatory percussion, the inferior border will be found to extend a variable distance below the umbilicus.

Dilatation of the stomach may be acute, transient, or chronic. Acute dilatation is a comparatively rare condition. In it there is relaxation of the muscular fibers of the stomach together with a probable spasm of the pyloris. It is more frequently the result of inflammatory processes consequent to gross excess in eating. However, it is also found that twists in the duodenum or its sudden incarceration are followed by acute dilatation. The outcome is usually fatal; probably the result of autointoxication, due to the complete retention of food within the stomach. More recently it has been shown that acute dilatation may result from operations on the bile passages, and also to follow shock of chloroform narcosis.

Transient dilatation is found occasionally where the gastric muscles are simply weakened. This occurs consequent to extreme mental depression, acute anemia, etc. It may also occur in a beginning stenosis of the pyloris, where subsequent compensatory hypertrophy of the gastric musculature corrects it for a time. Ordinarily, after a few days or weeks, the stomach recuperates and the condition disappears. However, the majority of cases of dilatation met with are those belonging to the chronic form.

The diagnosis is based on the consideration of the objective and subjective symptoms, the history of the case, the results derived from test-meal analyses, together with the physical exploration of the abdomen.

The symptoms of gastrectasis will vary in proportion to the severity of the condition present. The appetite is usually poor, altho it may be abnormally increased at times. This abnormal increase is due to a general cell-hunger and not to a local condition. There may be dryness of the throat and nearly always abnormal thirst. There is present a sensation of oppression and fulness in the epigastric region, together with fermentation and the formation of gases which, when eructated, are usually foul-smelling. There is usually vomiting of food. In an advanced case this may occur as often as twice a day, but in milder cases it may only occur every other or every third day. Pain and tenderness may occur after eating. The subnutrition of the patient is progressive, and an inability to perform mental or physical work gradually develops.

In dilatation due to malignant obstruction the severity of the disease rapidly progresses. Altho treatment may produce temporary amelioration, sooner or later ulceration with vomiting of blood occurs. Intense anemia, together with general muscular weakness, supervenes, and death is the speedy result. In benign obstruction, on the other hand, the disease continues a long time, and there may occur periods of euphoria when gastric compensation overcomes the insufficiency. The bowels are usually constipated, and the quantity of fecal matter becomes reduced one-half to one-third in amount. Likewise, there is marked diminution in the amount of urine secreted during the twenty-four hours, 1,000 cc. or less in the atonic form, and 500 cc. or less in the stenosing form. This urine is of high specific gravity and usually exhibits a complex indican reaction.

Analysis of the stomach contents should be made from a morning test-meal subsequent to lavage of the stomach performed the evening before. At the end of an hour the food will be found to be in a condition of fermentation, and there may be hyperacidity, hyperchylia, or practical anacidity, depending upon the condition of the mucosa. There is usually much mucous present, and when the stomach contents are allowed to stand in a glass. three layers are observed, the lower one of food, the middle mostly of a turbid water, and the upper one of frothing mucous containing particles of food. The total contents in the stomach, as estimated by the direct method of Mathieu, will amount to 200 to 300 cc. Yeast, sarcinae, and other bacteria will be found very active, and their activity continues for some time in the apirated stomach contents. In malignant obstruction free hydrochloric acid is usually absent,
sionally be present in benign stenosis.
lactic acid and the Oppler-Boas bacilli almost constantly present,
as also blood if ulceration has occurred. Lactic acid may occa-

The enlargement of the stomach may be determined by various methods, the most common one being the administration of soda bicarbonate and tartaric or hydrochloric acids in separate solutions. The carbon dioxide thus liberated distends the stomach, and its borders may be made out with exactness by ausculatory percussion. Coating the stomach with bismuth by means of an intra-gastric powder blower renders this viscus relatively impervious to the passage of the Röntgen ray, so that its outline may be readily determined by skiagraphic or flouroscopic examination. Coating the stomach with a suspension of reduced iron in mucilage of acacia has given me more distinct skiagrams of this organ. With the patient erect, the introduction of the electro-diaphane into a stomach containing water will so illuminate that organ as to give a good idea of its extent and position. A stenosis of the pylorus or duodenum may be determined by use of the Kuhn-Turck revolving sound.

The cause of gastrectasis is much more difficult to discover than the presence of the dilatation itself. However, a searching analysis of the clinical history, together with the results obtained from physical exploration, as also the analysis of the stomach contents, will lead to a diagnosis which, while not absolute, meets very fully the needs of the clinician.

The course of dilatation will materially differ according to the etiological factors contributing to the condition. Dilatation due to myasthenia may sometimes disappear spontaneously. It is usually amenable to treatment, as is also dilatation consequent to pyloric spasm.

The prognosis of the trouble in stenosis will depend upon the character of the obstruction. In beginning benign stenosis, it is often possible to establish a compensatory hypertrophy of the gastric musculature. However, sooner or later, this compensation is broken and surgical intervention is then the only recourse.

In case of malignancy no operation, unless it be early, particularly benefits the patient. And, at this time, there is usually no dilatation present. After carcinoma is fully developed, operation is of little or no avail.

A favorable response to treatment is based largely upon the observer's appreciation of the conditions present. The patient is in a condition of subnutrition, is nervous, weak, anemic, and constipated; the musculature of the stomach is stretched out of its normal relationship and is atonic. Atrophy of muscular fibers occurs in long-standing cases, and this degenerative process may be so pronounced as to make retraction of the stomach impossible. Coincidently the intestines are usually also atonic. The gastric innervation is likewise interfered with. There is stasis of the circulation in the stomach and other internal organs, i. e. we have a lack of equilibrium between the internal and superficial distribution of the blood. This stasis further depreciates cellular activity. Subnutrition produces a lack of tone of the abdominal muscles, giving rise to diminished intra-abdominal tension, which further aggravates the pathological condition present. The dilatation may also be complicated with the various forms of gastritis, with hyperchylia, hyperchlorhydria, or anacidity. Autointoxication must also be combatted.

The factors entering into our scheme of treatment may be classified under various headings, viz.: 1, diet; 2, hygiene and hydro-therapy; 3, gastric lavage; 4, electrical and mechanical treatment; 5, posture and rest treatment; 6, drug treatment.

1. *Diet.*—The food must be as concentrated and finely divided as possible. In ordinary cases not more than one glass of fluid should be allowed with each meal. Sometimes two meals a day

give best results; occasionally more frequent feeding seems demanded. The patient's dietary must be adapted to his particular needs. In case of persistent vomiting the patient may be fed exclusively per rectum for several weeks, when feeding by the stomach may be gradually resumed.

2. *Hygiene.*—The patient should give attention to the care of the teeth and mouth. All tooth cavities where germs may proliferate should be filled. Gingivitis should be corrected. On arising a cold sponge followed by a brisk rub is often beneficial. Alternate douching of the abdomen with hot and cold water causes a retraction of the stomach. Change of scene and relief from worry is highly beneficial. Plenty of fresh air and sunshine are needed. Gymnastic exercises tending to strengthen the abdominal muscles are of service in increasing intra-abdominal tension.

3. *Lavage.*—Lavage is indispensable, for it is the only means whereby complete rest may be afforded the overworked gastric musculature. Once a day is usually frequent enough altho in cases where there is severe fermentation it must be used oftener.

In mild cases it may be performed one hour before the heaviest allowable meal. In more severe cases lavage should be performed about ten o'clock at night, thus giving the stomach a rest and opportunity to retract. Alternately douching the stomach with hot and cold water is effective in improving its muscular tone and circulation. Intra-gastric pneumatic exercise does the same. After eating, the patient should be directed to lie down for half an hour or longer, best with the hips considerably elevated to enable the gastric contents to gravitate upwards toward the diaphragm, and thus be more readily emptied into the duodenum.

4. *Electrical and mechanical treatment.*—Electricity is extremely beneficial in dilatation, and is highly curative. It may be used intra-gastrically or percutaneously. In cases accompanied by hyperchlorhydria the intragastric application of the high tension Faradic current is indicated; in atonic dilatation the Faradic current derived from an ordinary coarse wire coil does best. Herschell in his manual on intragastric technic states that the high frequency current applied intragastrically diminishes the secretion of hydrochloric acid. My work has demonstrated to me that the same results may be obtained by the application of this current directly over the stomach. Its action in some cases is so pro-

nounced that even anacidity has followed its continued application. The tonic properties of the high frequency current, as well as that of the positive current taken directly from the coil, are extremely beneficial.

As patients suffering from dilatation are quite thin, it is difficult to fit them with an elastic support that will be of benefit in increasing intra-abdominal tension. Recourse is frequently made to the use of moleskin adhesive plaster which, applied according to Rose's method, is an excellent support. In women the use of the so-called surgical corset requirements does quite well. Various forms of elastic supports are used. Often a large pad attached to a Hood truss spring is excellent.

Massage both general and local is beneficial. If an excessive secretion of hydrochloric acid is present, vigorous local massage aggravates the condition. Vibratory massage gives deeper penetration than is possible by ordinary means.

5. *Posture and rest treatment.*—We find that some of our patients will not recover on any ordinary treatment. The patient becomes progressively more weak and nervous, so that gastro-enterostomy seems the only recourse. It is here that the rest and posture treatment often affords complete relief and also is highly curative. A modified Weir-Mitchell rest cure combined with the proper diet is instituted. The patient is directed to lie on a bed the foot of which is elevated eighteen to twenty-four inches, thus raising the hips higher than the shoulders. The head rests on a pillow. At night the bed may be lowered to the horizontal. By this means gravity favors the retraction of the stomach, and food passes more readily into the intestine.

6. *Drug treatment.*—Drugs are useful in preventing excessive fermentation, as also to increase the motor power of the stomach, and to modify gastric secretions or to supply these ferments when deficient. Strychnin is the best drug to increase motor function and to stimulate secretion. Large doses are necessary, and occasionally the hypodermic route is the best. It may be combined with bitters such as condurango, or xanthoxyllum; with acids such as hydrochloric, and also with the various ferments. Fermentation and putrefaction are prevented by keeping the alimentary canal clean thru the use of laxatives, preferably salines such as Carlsbad salts, and also by exhibiting the various direct

antiseptics, such as salol, bismuth salicylate, beta-naphthol, the sulphocarbolates, etc. Continuous secretion is best met by Boas' supersecretion formula. Excessive formation of hydrochloric acid often yields to Stockton's formula. These formulae, however, must often be modified and sometimes do not meet the indications in the particular patient. The constant anemia is combatted by iron, arsenic, and manganese. The treatment of gastric dilatation is quite comprehensive and requires close observation. Many cases which formerly were fatal, or which required operative interference, recover nicely under the rest and posture treatment. Patients who suffer from extensive atrophy and degeneration of the mucous membrane, and particularly the muscle wall of the stomach, can be benefited only thru surgical intervention.

To illustrate somewhat the diagnosis and treatment of gastric dilatation I will give brief notes of three cases:

CASE I.—*Dilatation secondary to mal-assimilation.*—Mr. H. E., age thirty-five, married, was first seen by me December 9, 1907. He has suffered more or less from what he terms stomach trouble for the last fifteen years. But it was not till November, 1907, that he began to have marked gastric symptoms, when he noticed a heaviness and pain in the epigastrium which progressively grew worse toward night. In the morning this would nearly disappear, but after eating breakfast it gradually recurred. Food passed through undigested, and the stools were tarry. In the two weeks previous to his treatment he had lost fifteen pounds. He had vomited decomposed food several times. On physical examination I found him quite thin and unable to get about without considerable effort. He was normal physically except for a dilated stomach, the lower border of which extended below the umbilicus one inch. Splashing sounds could be elicited over the stomach five or six hours after eating. The test-meal showed excessive mucous; acids and ferments much diminished, fermentation very active, motor function much reduced. There was considerable thirst, and occasionally he would become ravenously hungry, while at other times he could scarce eat anything. He was put on a partial rest and posture treatment; electrical treatment was instituted; tonics, Carlsbad salts, etc., were administered. Lavage at night was followed out.

In one week he had gained eight pounds and the stomach had retracted to the umbilicus. Two weeks after the stomach had retracted to its normal position, and all symptoms had disappeared, and the patient's weight was greater than at any period during his life.

CASE II.—*Atonic dilatation.*—Mrs. A., age 39, no children. At sixteen had chlorosis which lasted a couple of years. Since then patient has never been strong. About seven years ago began to be troubled with pressure and fulness after eating, together with nausea and a burning sensation in the epigastrium. She was also occasionally troubled with a diarrhea which came on in the morning. Three or four movements would occur. This condition would recur several days in succession, when the trouble would stop for a number of days or weeks, only to again recur. The patient complained of a bad taste in the mouth and was constantly weak and tired. She had voluntarily placed herself upon a restricted diet, as experience taught her that certain foods were sure to bring on distention and nausea. The examination of the patient revealed a very large stomach, the lower border of which extended within a couple of inches of the pubes. A splashing sound could be elicited at any point over the extent of the stomach.

The evening before the functional examination of the stomach was made the patient partook of a heavy meal of meat and rice. At ten o'clock the next day the patient was directed to eat an Ewald-Boas test-breakfast. This was withdrawn an hour afterward. There were 500 cc. of contents of an intense butyric odor and contained remnants of the meat and rice of the previous evening meal. The degree of hydrochloric acid was twenty-five, a little above normal. The total acidity eighty. The anemic condition of the patient, together with the apparent long-continued course of the disease, led me to believe that there was present simply an atonic dilatation of the stomach. The hyperacidity and fermentation were combatted by alkalies and resorcin. Iron and manganese were prescribed for the anemia.

Analyses made from time to time showed a diminution of the acidity and an increase of the motor function, such that four months after beginning treatment a condition of practical euphoria was established. Highly nourishing meals of scraped beef, eggs, toast, etc., with but very little fluid were ordered. Electricity used intra-gastrically proved to be quite beneficial. Three meals a day were given at above six-hour intervals. One hour before the heaviest meal the stomach was subjected to lavage.

CASE III.—*Beginning stenosis of the pylorus, together with probable adhesions of the pylorus and duodenum.*—Mrs. J, age forty-three, three children. The patient is poorly nourished, emaciated, and somewhat anemic. She has been generally healthy except for a series of attacks extending over the last twelve years. These attacks would come on at any time and were ushered in with pain over the region of the gall-bladder and in the epigastrium. There would occur vomiting of food and green-colored mucous. She would have clay-colored stools and the usual changes in the urine of a person suffering from a violent attack of gall stones.

Between these attacks she would be troubled with vomiting spells in which vomited material could be identified as having been eaten two or three days previously. Formerly these spells were infrequent but of late have occurred quite often. The bowels were constipated and amount of urine diminished.

The examination of the patient revealed an extremely enlarged stomach, the lower border reaching to two fingers' breadths of the pubes. Gurgling sounds could be heard emanating from the abdomen, and splashing could be elicited at almost any point of the area occupied by the stomach.

A functional examination showed 800 cc. of a foul-smelling mass which was held together by an excessive amount of mucous. The free hydrochloric acid was 28, total acidity 120. The digestion of starches was diminished, as an excess of free hydrochloric acid was probably constantly present. On standing, the contents formed into three distinct layers so characteristic of stagnation. A microscopical examination showed a great number of sarcinae. Mucous was present in large amount. The muscular fibers, becoming unequal to the task of forcing food past a narrowed duodenum, relaxed, and a dilatation resulted. It is also probable that the inflammatory process about the gall bladder and pyloris caused adhesions.

Operation was refused by the patient. A tonic treatment and systematic lavage was recommended, with considerable improvement.

THE BULLETIN

OF THE

UNIVERSITY OF NEBRASKA

COLLEGE OF MEDICINE

HENRY B. WARD, Dean, Lincoln HAROLD GIFFORD, Associate Dean, Omaha

THE BULLETIN is published quarterly in January, April, July, and October, by the University of Nebraska, at Lincoln, Nebraska

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All communications relating to THE BULLETIN should be addressed to
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EDITORIAL

The Meeting of the American Medical Associations and Alumni Reunions

The coming meeting of the American Medical Association is to be held June 2 to 5, in Chicago, which, by reason of its central and easily accessible location, will afford the doctors of the West and Northwest an opportunity to attend the session such as they have not had in many years. An especially large attendance is expected, since Chicago and local physicians are endeavoring to make this the most successful meeting held in some time. The city has some pride in being the greatest convention city in the country, and the doctors cherish the desire to entertain the visiting members of the Association. Business men's clubs and similar organizations are responding generously to aid in the undertaking, and the Chicago Medical Society expects to raise twenty thousand dollars to finance the affair.

A special committee is arranging for the hotel accommodations, etc., and some concessions are offered to the members of the Association; however, I would impress upon those expecting to attend the advisability of communicating to the Committee their intention, as the large number in attendance will certainly tax the accommodations of the city. The meeting will be held at a time of the year when most practicing physicians can get away for a little well-earned rest and avail themselves of the advantages of the meeting by virtue of the two-cent railway mileage in most of the states.

A special feature of the meeting of the A. M. A. in June will be the holding of alumni reunions by the leading medical colleges in the country, of which thirty are represented on the Alumni Committee. Tuesday night, June 2, has been set apart as Alumni night for the various reunions, and they will have precedence over all other business. At the recent meeting of the Alumni Committee reports were received from the various colleges showing the character of the reunions intended and the progress made, of which information will appear in the current state journals as soon as plans are complete. All will be held separately, and much pleasant rivalry is being manifested for each to have its banner reunion.

As the University of Nebraska College of Medicine has signified its intention of taking part, it is desired by all interested in her welfare that the representation by her alumni be creditable and adequate. This may be easily accomplished if each alumnus, upon deciding to attend the reunion, will make an effort to communicate with a nearby alumnus, either by letter or personally, and to secure the assurance that they will attend in company. Some little personal effort in this respect is fully justified by the occasion, and each should feel that he has a personal interest and duty in aiding the movement.

It is anticipated that our reunion will be a smoker with some little entertainment to enliven the occasion. It will provide a central meeting place, and it is hoped will see a large gathering of old and recent graduates, with plenty of good fellowship and a good time generally. The exact nature of the entertainment has not been decided upon in detail other than the time of meeting, but we trust in the near future to inform all fully with regard to the reunion.

The Alumni Committee of the A. M. A. has decided that there will be general alumni headquarters at the Auditorium Hotel.

Here will be found a bureau of information, place of registration for the alumni of each college, facilities for receiving and sending of mail, and other items of utility for the benefit of all who attend.

The Women Alumnae Committee, the Women's Medical Society of Illinois, and the Medical Women's Club of Chicago are combining their efforts to entertain the medical women visiting Chicago during the June session and extend a cordial invitation to a banquet and entertainment to be given on the evening of June 2. Relative to this reunion, I am in communication with the Chairman of the Committee and will in the near future send more definite information.

It will materially aid in completing final arrangements for the reunion of the University of Nebraska College of Medicine if each alumnus will immediately, upon deciding to attend the June meeting, notify Dean Ward or myself of his intention. This will confer no obligation but simply an indication of interest and enthusiasm in behalf of our College and alumni.

One hundred or more it is hoped will be in attendance. This will be possible if each alumnus brings a brother practitioner along with him. We are all concerned that our reunion do credit and be representative of the University of Nebraska School of Medicine. Later definite information relative to the reunion will be sent in a personal letter.

G. C. SHOCKEY, 1902.

Representative of The University of Nebraska College of Medicine, on the Alumni Committee of the A. M. A.

The Review Course

From May 12 to 18, inclusive, the College of Medicine will give its annual review course for practitioners. As to its successful issue there should be no doubt, either from the point of view of the applicants for the course or from the point of view of the University. Medical men who have not entirely fallen into the rut of unthinking routine are feeling the need of some method by which they can grapple with the hurrying progress of medical knowledge,—a method more illuminating, more impressive, and more certain than lectures or reading. It must be a method in the nature of laboratory work and of clinical work dealing with problems or applications of practical significance. It is not sufficient to read and hear about blood-pressures, the opsonic index, and Calmette's reaction, but blood-pressures must be obtained by actual experiments and tests, the technic of obtaining the opsonic index must be followed out in detail, and the ophthalmo-tubercular reaction demonstrated at the very least, in animals. In recognition of this need some of the faculty of the College of Medicine, enthusiastic with the "Ferien-Kursus" of European schools, urged the establishment of similar courses in the University. The College of Medicine would then rank, as it should, representative of the highest and most advanced methods of medical instruction.

From the point of view of the University it is hoped that the annual review courses will establish closer bonds of relationship and greater mutual interest between the College of Medicine and its Alumni. The greatest single asset in the reputation of the College of Medicine is likely to be the active, working cooperation of its Alumni. The successes and the failures of the one reflect upon the other so that in the realization of this fact the faculty stand ready to give what they can in time, labor, and sacrifice whatever may lead to a common weal.

COLLEGE NOTES

Dr. Matilda Berg, '07, died in Omaha on March 7 after a short illness.

Drs. H. H. Waite and R. H. Wolcott have been made members of the Athletic Board.

Dr. Leroy Crummer has been recommended by the Board of Trustees to the chair in therapeutics.

Dr. G. H. Bicknell has for some time been on the sick list, owing to some abdominal disturbance.

Dr. and Mrs. A. F. Jonas returned February 10 from a three-months trip to Egypt and the Holy Land.

Dr. Nelsen, of Shoshone, Wyoming, '04, visited the College of Medicine in Lincoln on February 26.

Dr. Merle Warner, interne at Wyoming General Hospital, visited his parents in Council Bluffs, Iowa.

Dr. H. G. Morris, '05, Creston, Nebraska, and Dr. Harry Benson, '03, of Norfolk, were in Omaha recently.

Dr. Guy P. Stokes, '07, of Fullerton, North Dakota, passed third in the North Dakota State Board examination.

A daughter was born to Dr. and Mrs. R. W. Bliss on March 1; and Dr. and Mrs. Henry B. Lemere are rejoicing over the birth of a son.

Dr. B. A. Adams, '05, of Bristol, South Dakota, visited the College recently. The Doctor was on his way to Colorado to buy some land.

Dr. A. B. Lindquist has recently moved from Lincoln to Omaha and is doing eye, ear, nose, and throat work with offices in the Karbach block.

Dr. Merle Warner, '07, has left the Wyoming Hospital at Rock Springs and is now house-surgeon at the Wyoming State Hospital at Sheridan.

Dr. Frank E. Osborn, of Beatrice, was elected president of the Gage County Medical Society at its annual meeting held in that place January 7, 1908.

Dr. John Buis, '07, and Miss Serena Knutsen were married at the bride's home in Lexington, Nebraska, on March 11. They will reside in Pender, Nebraska.

Dr. H. A. Cooper, for the past two years physician for the Union Pacific Coal Company at Superior, Wyoming, has resigned his position at that place and has located at Lander, Wyoming.

Dr. H. S. Finney, of Rawlins, Wyoming, for six years physician to the state penitentiary, has resigned, and his place has been filled by the appointment of Dr. Raymond Barber as his successor.

On April 8 Miss Mary Ames, recently of Grand Island, became the wife of Dr. Herbert H. Waite. The wedding ceremony was witnessed only by near friends. The many friends of Mrs. Waite are delighted to again claim her as a Lincolnite.

At the fifteenth annual meeting of the Custer County Medical Society, held at Broken Bow, Nebraska, February 11, 1908, Dr. C. J. Christenson, of Broken Bow, was elected president for the ensuing year, and Dr. Claude L. Wills, of Anselmo, was elected vice-president.

The program for the annual meeting of the American Society of Tropical Medicine, which was held this year at Johns Hopkins Medical School, contained a paper by Dean Ward on "Some Notes on a Collection of Entozoa Made by Dr. F. Creighton Wellman, in Portuguese East Africa."

The Bulletin is glad to announce to the alumni of the College that Dr. Leroy Crummer is one of the staff of clinical consultants of the Council of Pharmacy and Chemistry of the American Medical Association. Dr. Samuel Avery was tendered an appointment as a member of the Council, but owing to the demands of his already too numerous duties, was regretfully obliged to relinquish the honor.

In addition to the regular meetings the Pathological Club of the College of Medicine has held several special sessions. At one of these, on February 6, Dr. Palmer Findley gave an intensely interesting and instructive talk on Human Placentation. Non-members who were guests of the evening were Dr. Bolton of the University; Dr. Hart, of Omaha; Dr. Benedict, of Omaha; and Dr. Ransom, of Washington, D. C.

In the official business of the second day, marked progress was made in reaching a uniformity of standards and in providing for the reasonable advance in entrance requirements for medical schools. Dean Ward was president of the Association this year, having been elected in recognition of the work done by the University of Nebraska College of Medicine. His presidential address was an exceedingly frank discussion of standards and tendencies in medical education. The president of the Association for next year is Dr. E. H. Long, of Buffalo, New York. Dean Ward was elected to the Judicial Council for a three-year term.

Dean Ward went to Cleveland, March 13, as the official delegate of the University for the annual meeting of the Association of American Medical Colleges. The official sessions were held at the Cleveland Medical Library, March 16-17, and were participated in by representatives from forty medical colleges and a dozen state licensing boards. The first day was devoted to a discussion on the raising of standards, the work of academic seniors in the professional school, problems of the state university and the equipment of the standard medical college. After the president's address in the evening, the Cleveland Academy of Medicine tendered the Association a smoker in the club rooms.

Two medical convocations held during the past quarter are worthy of being placed on record. On February 6, Dr. Brayton H. Ransom, Chief of the Division of Zoology, Bureau of Animal Industry, U. S. Department of Agriculture, spoke on certain phases of government work of special interest to medical men. On February 19, Professor Russell H. Chittenden, Dean of the Sheffield Scientific School of Yale University, addressed the medical students on Economy in Nutrition with Reference to Personal Helath and Efficiency. Professor Chittenden's remarks provoked unusual interest and discussion. Later, at the suggestion of Dean Ward, a number of enthusiasts had the pleasure of dining with the distinguished visitor at the Lincoln. While in Lincoln Professor Chittenden was established at the home of Dr. R. G. Clapp.

On March 19 the Pathological Club had the honor of giving the evening program of the Missouri Valley Medical Society, which was in session in Lincoln at the time. The program was as follows: "Skiagraphs of General and Acquired Deformities of the Feet," by H. Winnett Orr; "Simple Methods of Detecting Formalin in Milk and Boric Acid in Meat," by Benton Dales; "Variations in Blood Pressure Due to Central and Peripheral Influences," by R. A. Lyman; "Determination of Blood Pressure in Man," by H. J. Lehnhoff; "The Histology of the Auriculo-ventricular Bundle of His," by W. A. Willard; "Artificial Heart Block—Its Relation to Stokes-Adams Syndrome," by A. E. Guenther. In selecting the various items of the program the committee in charge of the program were guided by two considerations: (1) to select demonstrations of medical interest; (2) to select demonstrations illustrative of the methods used by the College of Medicine in instructing students. A conservative estimate places the number of people present at one hundred.

The following clipping is taken from the *Daily Nebraskan:*

H. W. WILEY ACCEPTS INVITATION FOR COMMENCEMENT

Dear Dr. Ward—Absence from the city has prevented an earlier reply to the very flattering invitation which you sent me under date of the 3d instant to deliver the Commencement address for the College of Medicine on Thursday, the 21st of May. I take pleasure in accepting the invitation, and this pleasure is the result of many factors. First, I am anxious to meet the medical profession of Nebraska, which has stood as a unit for purity of foods and drugs; and, second, I am glad of the opportunity of seeing again that portion of Nebraska which is preeminently recognized as standing for higher education; and, third, I am glad to accept the invitation because I consider it a recognition, not of me personally, but of the principles for which I have tried to stand.

Sincerely,
H. W. WILEY.

In response to the request of Dr. John S. Fulton, the Secretary General at Washington, for the International Congress on Tuberculosis to be held there September 21-October 21, 1908, the provisional committee for Nebraska, consisting of Dr. Chas. O. Giese, Holdrege, temporary chairman; Dr. A. S. von Mansfelde, Ashland; Dr. S. R. Towne, Omaha; Rev. S. P. Morris, Omaha, met at the Commercial Club rooms, Omaha, December 24. Dr. H. M. McClanahan, vice-president of section on Surgery and Orthopedics, and Dr. H. B. Ward, Dean of the Medical Department of the University of Nebraska, vice-president of section on State and Municipal Control of Tuberculosis, were ex-officio members of the committee. The latter was detained in Chicago. The organization was there completed as follows:

Dr. A. S. von Mansfelde, Ashland, Chairman.
Dr. Chas. O. Giese, Holdrege, Treasurer.
Stephen P. Morris, Omaha, Secretary.

Dr. S. R. Towne, Omaha.
Dr. E. J. C. Sward, Oakland.
Dr. W. F. Milroy, Omaha.
Mrs. Draper Smith, Omaha.
Dr. H. B. Ward, Lincoln.
Dr. Chas. O. Giese, Holdrege.
Stephen P. Morris, Omaha.

The immediate work before the organization is to engage the attention of our state, the medical profession, the live stock interests, and all social forces toward our greatest international congress in September next. To carry on this correspondence and distribute literature, means will be required. Members of our state organization will be solicited first, then the county medical societies, the fee of a dollar being payable to the treasurer, Dr. C. A. Giese, of Holdrege, the membership card being returned by him.

The physicians are requested to engage the interest of any and all in their respective communities, to aid in our state educational effort by becoming members of our state organization at least; and names of such public spirited citizens are earnestly solicited that printed matter may be sent them for distribution in the mail or otherwise. The forty-six nations and forty-six states cooperative will bring out much valuable matter for the scientific understanding of tuberculosis itself, and of the best methods for its control in animals and man, will result from the deliberations of this great congress, and the matter will be printed in English in four volumes, all of which can be secured by any one who becomes an active member of the Congress for the small fee of $5. The fee of $2 makes one an associate member, but does not secure the volumes of transactions.

The executive committee would be glad to receive suggestions upon methods of interesting the public of our state in the subject of Tuberculosis and its prevention.

—*Western Medical Review,* 13:44-45.

THE BULLETIN
OF THE
UNIVERSITY OF NEBRASKA
COLLEGE OF MEDICINE

VOL. III *JULY 1908* No. 3

The Prophylactic Aspects of Medical Studies[1]

BY HARVEY W. WILEY, WASHINGTON, D. C.

On an occasion like that of today when a number of young men who have been trained in the theory of medicine are about to enter upon its practice, it may be profitable to view from the position of an outsider, and yet one who is vitally interested in the profession, some of the present aspects of medicine. In treating of these aspects I do not do so either from the point of view of the specialist in medicine nor as a hygienist, but from that of the public more or less instructed in the supposed mysteries of medical science. The relation of the profession to the public, just as much as of the members of the profession to each other, demands special consideration.

In this light it is seen at once that the physician plays two distinct and equally important rôles. He by common consent is made the guardian of the public health, and he is the one, when the individual's health has been impaired, who is called upon to restore the patient to his former condition.

It is particularly from the first point of view that I desire to direct my remarks today. The physician is the guardian of the public health in the sense that it is a part of his duty as a professional man and as a physician to see to it that the causes which produce disease are as fully eliminated as possible from active influence upon the public at large. In other words, the great principles of sanitation are those with which the medical fraternity is particularly concerned. Sanitation relates first of all to supplying in a state of purity those necessities of life without which it can not be maintained even for a short time in a safe and serviceable state. The three great necessities of life which are absolutely insistent in their demands and which must be constantly provided are air, water, and food. To the consideration of these great bases of vitality the medical profession must give its careful and continual attention.

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[1] Address to the Graduating Class of the School of Medicine of the University of Nebraska, May 21, 1908.

The problem of fresh air is not only one of hygiene, but also of engineering, and it is unfortunate that in the development of architecture so little attention has been paid to the vital problem of ventilation. It is strange in this modern day to see so many buildings in which are herded the human race from early childhood, viz., the schoolhouse, the church, the court room, the theater and the lecture room, which have been erected with so little regard for the supply of pure air.

I would not for a moment decry that one great purpose of architecture, viz., beauty and proportion. The existence of a fine building from an architectural and esthetic point of view is a constant education, imbuing the whole community, even unconsciously, with correct ideas of art and esthetics. I should for one not ask that a single feature of architectural beauty be sacrificed in the erection of our public buildings, but I believe that the true principles of ventilation and the furnishing of pure air to the occupants of our buildings need not interfere with the beauty either of the exterior or the interior of the structure.

This idea of pure air should be carried especially into the homes, where so often the sleeping rooms are devoid of proper ventilation facilities, and those that are present are kept in a state of "innocuous desuetude." Somehow or other our people have an idea, especially in reference to bedrooms, that fresh air is a kind of insidious poison. How often have we heard mothers caution their children to beware of the night air! The open window, the ventilating flue, and the well-drawing chimney should be carefully provided in every living room and every bedchamber of the house.

Much has been said in modern literature respecting the curative effects of fresh air in certain forms of insidious disease, such as, for instance, tuberculosis. Much more may be said in praise of the prophylactic properties of fresh air, which tend to strengthen the body and keep the blood aerated, and thus ward off disease.

The common kind of carpets and of sweeping does much to fill the air with particles of matter, minute in size and yet capable of collecting upon the mucuous membrane and causing trouble. Any one who has such an unfortunate habit as to still be in bed on a bright morning when the rays of the sun are horizontal may see thousands of particles of matter floating in the air. I do not call attention to this with any idea that the air in general is free from dust, because such is not the case. It is well known that even the purest air at very remote distances from the earth's surface carries innumerable particles of dust, but those that come from the sweeping of carpets are much more to be feared in their deleterious effects than those which are found in the open, so if we must breathe dust and dirt let it be that of the open rather than that of the closed bedroom. The dust of the bedroom with its accumulation of the excretory products of respiration renders it unfit for further breathing. It is true that no one can expect to breathe air that has not been breathed by any other person, but we can expect a reasonable supply of outdoor air admixed therewith.

The medical profession should use its influence in modifying the architecture of the future so as to secure good sanitary habitations for all.

The relations of the medical profession to the water supply are so well known and have been so fully developed that little attention need be called to them at the present time. In this particular community perhaps the principal problem in connection with the water service is the elimination of silt. This is perhaps more important from the ocular point of view than from the digestive, because in this wide country where habitations are infrequent and the population is sparse the soil is reasonably pure. If the old adage be true that every one must eat a peck of dirt during his life, however, I fear that the activity of the human race in this instance would be somewhat limited by a too early compliance with the rule. At any rate, removal of the silt is demanded by all consumers. I will not waste any time on this occasion with a description of the various forms of filtration proposed and in operation for this purpose. I only call attention to this peculiar case where the silt is so fine and its colloidal nature so perfect that it is separated with great difficulty by any kind of a filter. In these cases it seems necessary that some electrolyte be used, because it appears from the researches of chemists that the colloidal suspension of silt is due to a certain electrical charge, and when this electricity is discharged by means of an electrolyte, coagulation of the silt takes place and its separation by filtration is easily accomplished. The best of the electrolytes are those substances such as alum, iron and copper sulphates, usually combined with lime, which are commonly adjudged to be injurious and which should not be introduced into the human organism. It is, therefore, one of the duties of the medical profession to see to it that when chemical coagulation is practised previous to filtration of a water supply, it should be so conducted and so controlled that none of the reagents used for the production of coagulation be found in solution in the clear filtered product.

The preservation of the source of supply of the water from contamination, especially with pathogenic germs, is also a problem of equal importance. It is the duty of every community to so safeguard its water supply as to avoid the dangers of epidemic diseases due to the contamination of the supply itself. So well has this principle been recognized that many of the important cities of the country have expended millions of dollars in securing from uncontaminated sources a wholesome supply of water. But even in these cases filtration should rarely be neglected since unexpected sources of contamination often occur, and it is well known that a good filtration, especially the best of the sand filtrations, removes practically all the organisms, both good and bad, from the water. Inasmuch as the bad organisms are always immensely inferior in number to the good, the doctrine of probabilities shows that where good filtration is secured, leaving only from ten to twenty organisms per cubic centimeter, the danger of contamination from pathogenic germs is always reduced to a vanishing quantity.

Quite as important as the water supply is the disposal of the sewage of the densely populated communities. I think the medical profession must set its face against the old-fashioned method of dumping the sewage into the running streams, thus contaminating the waters of all living below these sources. No difference how great the magnitude of the water current may be, there must be danger of contamination for a given time, for it takes several hours and sometimes longer for the contaminated water to be purified by the action of its own nitrifying organisms, and even in those cases the pathogenic germs may sometimes escape destruction. I believe it will be necessary in the future that the great cities, and the small towns, too, for that matter, make some arrangements for the disposal of their sewage by pumping it back upon the land. This, of course, is easily accomplished with a reasonably level country and one of a sandy character. It is far more difficult of accomplishment in the case of cities situated in valleys where the amount of low lands available for the disposal of sewage is limited in quantity. The condition of the city of New York at this time in regard to the disposal of its sewage and garbage is one of interest. The sewage of New York is poured either into the Hudson or the East river. The board of health has condemned as unsuitable for consumption the oyster beds lying in the immediate vicinity of New York city and its harbors. These vast beds of oysters, so valuable as a food product and so much prized by the gourmet, are now practically forbidden sale, and can only be utilized under inspection of sanitary officers. The problem is more an engineering than a chemical one, and yet it must be thru the agitation and influence of the members of the medical profession that the proper engineering schemes be introduced and operated to free the country of the danger that is imminent from the present methods of disposing of sewage.

The third interest of life which I mention as one that particularly concerns the physician is the food supply. This is part of the problem which it has been my fortune, good or bad, to have studied more than all the others, and one which, therefore, I speak of with all the greater diffidence. It seems that it is unfortunate and yet it is fortunate that the more one studies a subject of the importance of this one, the less he feels himself qualified to utter dicta concerning it. But I feel that I must, at least, make a passing notice of the importance of the food supply in its relations to the public health. I shall not mention that other, perhaps more important, aspect of the question, namely, the relations of the food supply to fraud and deception. That the health of the community depends largely upon the character of the food is admitted by all. Nutrition is not only a matter of quantity but also of quality. The greatest abundance of spoiled food would not be suitable for the sustenance of life, and yet life may be sustained for a time upon almost incredibly small quantities of pure food. I mean by the word "pure" applied to food products in this sense an article of diet which is either in its natural state, or, if modified by man, has not had its valuable ingredients abstracted nor has had added to it any injurious or harmful ingredient. In this great country of ours where the production of food is one of the chief industries, the problem of its conservation and transportation is one of more than usual interest. We not only must distribute foods to our own people, especially in the great crowded centers, but we must also supply the demand of foreign countries, in so far as possible for our food products. Thus the preparation of food products for transportation is a legitimate industry of the greatest significance to our prosperity. My own work in this matter has been confined largely to the study of the processes of preserving foods by chemical means, that is, by means of drugs and chemicals which have no condimental value, have practically no odor and very little taste, and which, therefore, may be added to food products without appreciable effect on their palatability or general flavor.

The methods of preserving foods for transportation are well known. Many food products, like the cereal grains, require no special means of preservation, except to be kept properly dry and ventilated. In this condition, if the infection of insects is avoided, cereal grains are kept for an indefinite time without appreciable deterioration. But most of the other food products, such as meats, vegetables, butter, and milk are of a more perishable nature, and unless certain precautions are observed they will not bear keeping for any length of time when transported to any great distance. In order that these food products may be conserved, certain well-known and unobjectionable processes are practiced. I may mention among these cold storage, desiccation, and sterilization. It is well known that when a food product which tends naturally to decay is reduced to a temperature below freezing point the progress of fermentation and decay is arrested with more or less completeness. In this condition the food product will keep a reasonable length of time with no appreciable deterioration. In fact, some food products are considered by connoisseurs to improve for a time by storage. Such products are fruits harvested before they are ripe, meats of certain kinds, both fresh and preserved, etc. Other products which may be kept in cold storage and which do not improve are dairy products of all kinds, fish and eggs, and yet these products may be kept for a reasonable length of time without undergoing any marked deterioration, and, therefore, refrigeration becomes a most valuable and indispensable aid for the preservation and transportation of foods. When practiced under proper control and within proper limits of time it can only be commended as one of the blessings of humanity. The drying of food products which otherwise would rapidly decay is also a legitimate practice which is exercised in many products, such as meats, fruits, and vegetables. The sterilization of food products by the application of heat, or the pasteurization thereof by a lower degree of heat, is one of the most important and useful methods of preserving food products. Organic bodies which are sterilized in this way, or pasteurized, do not undergo decay unless reinfected or reimpregnated with the germs, because decay is conditioned chiefly by the activity of certain bacteria and enzymes which are found in all foods in a natural state. The great canning industry of the country is an evidence of the magnitude of the processes of sterilization and pasteurization. When conducted under proper control this method of preserving fruits is not open to any objection. The preserving of foods, however, *vi et armis,* that is, by means of tasteless and odorless chemicals, is quite a different proposition. Here a body must be added to the food which itself has the power of destroying, or at least paralyzing, the bacteria and other ferments which cause decay. I believe I may safely say to the members of the medical profession today that this method of preserving foods is almost universally condemned by our fraternity. Experience has shown in the first place that these methods of preserving are unnecessary, and experiment has shown further that the bodies themselves are of a character which can not fail to produce injurious results. Being drugs, they can only act as drugs, and while they might be useful in cases of disturbed conditions of health, they certainly can not be recommended in a state of ordinary health. Investigations which I have made, as well as those which have been made by others, show unmistakable changes in the metabolism of an injurious character, and the production of medical and clinical symptoms show disturbances of a very serious nature in the ordinary functions of the body. Moreover, these bodies are excreted chiefly thru the cells of the kidney, and many of them are of a nature inducing specific organic changes which sooner or later lead to grave lesions destructive of tissues and of health. I believe, therefore, it is the duty of the medical fraternity to stand with a solid front in opposition to the methods of preserving foods by the addition of chemicals of this character.

There is generally a mistaken idea in regard to adulterated or impure foods in that they are associated with effects of a violent and well-marked character, producing sudden illness of a severe type and even with a fatal result. I do not seek to minimize the dangers which lurk in foods of this kind, but call attention particularly to the fact that these dangers are very rarely met; with the exception of the development of ptomaines in foods, producing a poisonous effect, there are very few cases on record of fatal illness due directly to the administration of adulterated foods. The dangers in impure and adulterated foods are of a different character. The effects which they produce are slight and their harmful results are insidious. The administration of a food which is adulterated or impure, while not often producing sudden and serious illness, tends rather to gradually undermine the vitality of the system and its power of resistance to disease by the production of a succession of small effects, disturbing metabolism and finally affecting the health of the principal organs of the body. These effects are of such a character in foods as to be traced with great difficulty, and are usually entirely overlooked when the physician comes to make his diagnosis. The disease from which the patient is suffering at such a time is usually one which the diagnostician would hardly attribute to long years of use of deleterious food products. I refer particularly to the substances which are added to foods rather than to lack of care in the preparation and handling of foods, resulting in putrefaction and its necessarily dangerous and concomitant results. Nearly all the substances which are added to foods in the form of preservatives, or coloring matters, are those which have no food value, undergo little or no change in the system, and are excreted in practically the same form in which they are ingested. These bodies necessarily are very poisonous to the cells, especially the protoplasm of the cells, else they would not affect those organisms in foods which produce fermentation and decay. Since in the excretion of these bodies they must ultimately come in contact with the protoplasm thru the cells of the organs, it is theoretically certain that these cells must be injured to a greater or less extent. This theory is borne out by practical histological examinations of the lower animals which have been fed for a length of time on the ordinary chemical preservatives. In such cases the kidneys especially have been found suffering from this change, undoubtedly caused by the long administration of these chemicals. Even in small quantities, therefore, these preservatives must be looked upon as of a harmful character, gradually sapping the vitality of the body by deranging the functions of those organs particularly charged with getting rid of the katabolic products of the body, together with substances which are wholly non-metabolized as in the case of the preservatives and coloring matters above alluded to. The point which is especially emphasized in this case is the offense against hygiene and health in adding to food products any of these extraneous bodies which can not possibly do any good and which must certainly in the long run do harm.

The adulteration and misbranding of drugs leads to results of the gravest character in actual therapeutics. Assuming, as we do, not only from a sense of conviction, but also for the sake of the argument, that drugs have actual therapeutic value, this value must be associated with their actual properties. Substitution of one drug for another, therefore, robs the physician of his armament and injures the patient by depriving him of the remedy which the physician supposes he has administered. If the adulteration of foods which are taken usually in a state of health is reprehensible, what must we say of the adulteration of products which are to be administered at vital crises where the life of the patient is hanging in the balance? In one respect it seems to me our national food and drugs act is very much at fault in this matter, namely, in admitting into interstate commerce drug products which are not of the standard strength and purity prescribed by the pharmacopoeia, provided their actual strength and purity are named upon the label. These drugs which are not of actual strength and purity, according to the pharmacopoeia, may pass freely into interstate commerce if labeled so as to show their variation from the standard. When such products enter into manufacture within a state they may be exposed for sale at all the drug stores without their standard of strength having been written upon them. Hence, the consumer, that is the patient, may often be the recipient of drug products under pharmacopoeial names which do not conform to pharmacopoeial purity and strength. This condition of affairs could, of course, be remedied by state legislation which would require drug stores within the state to sell only in standard prescriptions articles of pharmacopoeial purity and strength. This fault is one which doubtless will be remedied in the future if its evil effects as above indicated can be clearly demonstrated.

The final effect upon the public health of purity of foods and drugs, it seems to me, is a matter of no doubt. I am confident the pure food and drugs law will tend, first, to ward off disease, and, second, to effect its more speedy cure, thus not only increasing the happiness of human life but also prolonging it.

Another important way in which disease may be prevented is found in the quarantine system. Practically every civilized country at the present time recognizes the value of quarantine and also legalizes its practice. The principle of the quarantine is applied in several ways. First, attention may be called to the quarantine against disease coming from foreign countries. It is by a rigid application of this principle that such epidemic diseases as cholera and yellow fever are excluded. It is, I believe, pretty well established that neither one of these diseases is indigenous to the United States. In the case of cholera the nature of the germ or enzyme which produces it is not well understood. That it is carried, however, in some way in the water, or the food, or the air is quite certain since it can hardly be regarded as a contagious disease in the ordinary sense of that term. In the case of the other disease mentioned, however, the method of infection has been definitely determined. A certain species of mosquito known as *stegomyia* has the property of itself becoming infected with this disease when it feeds upon an infected patient, and thus of transmitting it to other people on which the infected insect may feed. While it would be advisable, if possible, to exterminate this species of mosquito, that is hardly regarded at the present time as a possible contingency. The next best thing is to prevent the mosquito itself from becoming infected. Thus arises the principle of quarantine against foreign countries from which the disease may be imported. So thoroly established is the quarantine at the present time that no foreign vessel is allowed to discharge its cargo or its passengers within the territory of the United States without first undergoing inspection by health officers. This method of quarantine often imposes hardships upon innocent persons, since if one of the passengers of the ship be infected with a contagious or epidemic disease all others are required to be quarantined until the danger of the development of the disease is past.

The second, and more common principle of quarantine, is isolation. This principle is practiced in all cities at the present time where such diseases as smallpox, scarlet fever, whooping cough, and measles are restricted by isolation. In the case of smallpox particularly the patient is isolated in a special hospital provided for the purpose, while in the case of the other diseases the isolation usually takes place at the home of the patient. In whatever way, however, the isolation is established it is recognized as an application of the principle of quarantine. The efficiency of this system of isolation was well illustrated two years ago during the outbreak of yellow fever in New Orleans. By a combination of an attack upon the mosquito and by the isolation of the patients, the disease was confined to a very restricted portion of the city, and disappeared long before the proverbial frost, which during previous attacks was regarded as the sole efficacious measure for the destruction of the disease.

The question of quarantine is now broadening along many lines with a final view of eliminating, or at least restricting to a very small area, diseases which destroy mankind. I call attention particularly to the efforts now making to eradicate tuberculosis. Not only is this beginning with the cow, which is so commonly affected, but this principle is also being extended to the human animal. The idea is becoming fixed in the minds of the medical profession, as well as in the minds of the people at large, that a successful fight against tuberculosis can only be instituted on the principle of segregation which has long been applied to leprosy. It seems a hardship to condemn to a life of isolation thousands of our fellow citizens who represent the very best and noblest types of man of our civilization except physically. Isolation, rest, and outdoor life are now regarded not only as a means of preventing the spread of the disease but even as effecting a cure thereof. Those who have ample means can afford this life of isolation at their own expense, but the State must evidently provide the funds for those who, deprived of their opportunities of earning a livelihood, are condemned by law to lead a segregated life. In this case the principle of the greatest benefit to the race must be acknowledged as supreme above the sentiments of humanity and of friendship. I think the medical profession may look forward to a time not far distant when members of the community afflicted with tuberculosis will be separated from their fellow men and kept under proper sanitary conditions in camps of detention until a cure is effected or until the disease has run its course.

This is not the place to discuss plans and specifications for camps of detention for tuberculosed patients. The only thing that is necessary to be said is that upon the whole they must be conducted at the public expense and under the supervision of the State.

It may appear from the above that my idea is to impress upon the young men here who are about to receive their degree of doctor of medicine the fact that the work of the physician in the future is not so much that of the person who helps at the bedside as the one who will make the bedside help unnecessary. This to a certain extent is true, and to this extent the noblest work of the physician will be that which will curtail the opportunities for the exercise of his professional life in the way of increasing his own income. Thus it appears to me that the physician of the future, as was the case with the one of the past, will still be actuated by that noble spirit of altruism which has always characterized the true members of the profession. At the same time it must be admitted that the physician should not be oblivious to the wrongs and ills which come to his professional career through the practice or so-called practice of medicine by quacks and pretenders. The physician is compelled by law not only to undergo a long course of training, but also, before indulging in the practice of his profession in any locality, to qualify before a board of experts and receive a license to establish the fact that he has the ability and training to practice his profession. What a shame, then, is it to see others without qualifications, except that of effrontery, and without training save that of the defrauder, openly and boldly practicing medicine, so to speak, under the very nose of the qualified physician! Under our present system any quack may advertise his wares in the public press, prey upon the fears of the sensitive citizen, and even endanger his life. This is done in the first place by making him believe he is ill, and in the second place, if he is ill, that he may be cured by the administration of the remedies offered without any knowledge of the case, the symptoms, or the conditions pertaining thereto. Thus thousands of our fellow citizens who would otherwise be under the care of the legitimate and competent physician are left to be the victims of the quack and the pretender. Without denouncing as valueless the so-called patent or proprietary medicines which are offered to the public, I must say that it is only common justice to require that before any such remedies may be sold or offered for sale in any community those who mix them and offer them for sale should be compelled to qualify in that community as a regular physician is compelled to do. If the States, therefore, would make the same rule for the *absent* treatment of disease that they do for its *present* treatment the whole system of fraud and deception which is now so much in vogue would fall to the ground. It would be quite impossible for any of these so-called pretenders to qualify before any board of competent physicians and receive a license to practice medicine in any community. Thus while the advancing science of medicine offers to the physician a restricted field of active practice at the bedside and places upon him the insistent duties of the "noblesse oblige" of his profession, public opinion should secure for him an open field and freedom from the competition of fraud, incompetence, and deceit.

You are about to receive, I believe, the degree of doctor of medicine. This is one of the things to which I object. A man is not a doctor nor can he be a doctor at the end of his school days. Learning which should entitle one to bear this appellation is not that which is obtained in the school room and from books during the years of early youth and manhood. Real learning comes only from experience and application, and while I do not begrudge you your degree of doctor, I would be glad to see the habit of giving the doctor's degree discontinued in all the medical colleges of our country. Let the doctor's degree come in after life when each one has earned his spurs and is really entitled to the appellation of Learned and of Guide. But I congratulate you, young men, just the same, on having attained the first summit of your ambition, and being now adjudged worthy, by your professors and by the board of governors of the great University of which your school is a part, of the degree of doctor of medicine. So direct your lives that your Alma Mater may never regret having conferred upon you this sublime distinction.

Antidiastase from Tapeworms

BY L. P. HOLLISTER, LINCOLN, NEBRASKA

Previous to the discovery by Kirchoff in 1814 of a substance in gluten which hydrated starch, physiological knowledge had been inadequate in explaining how complex foods were broken down in the body and rendered fit for assimilation. With this discovery the more or less crude hypotheses concerning the reason why these changes in food take place within the body with greater rapidity and at lower temperatures than they can be brought about outside of the body gave way to the conception of definite bodies with specific action, designated enzymes later on, by Kühne.

Enzymes have the power of stimulating certain chemical reactions and have proved to be the principal means by which organisms make use of the highly complex foods such as are found in nature. But comparatively recent discoveries have shown that there are present in animals not only enzymes but also bodies, which have the power of inhibiting enzyme action. The opposing bodies are termed antiferments, antienzymes, etc., to distinguish them from the simpler chemical inhibiting agents. Ernst Weinland, for instance, in 1903 proved the existence of antitrypsin and antipepsin in the walls of the stomach and intestines and in the bodies of parasitic worms. So striking and so marked are the published reports of these experiments that, in view of the specificity of anti-bodies in general, the question naturally arose as to the existence of bodies of an antidiastatic power in intestinal worms.

A series of experiments carried out in the physiological laboratory of the University of Nebraska has yielded interesting results. The worms selected were those found in the intestines of dogs and were in the majority of cases *Taenia serrata.* They were obtained immediately after the death of dogs which had first served for other experiments. The active diastatic preparations were watery extracts of the thyroid glands of dogs. The starch employed was the soluble starch of Kahlbaum.

Experiments.—The results of the experiments appear to show that the body of the tapeworm possesses a diastatic ferment; the outer cells or surfaces possess an anti-body detrimental to the action of the diastase. For example, a water extract of ground tapeworms taken from a freshly killed dog was placed with an active diastatic thyroid extract and allowed to stand several hours. The mixture was then added to a given amount of soluble starch solution, the whole covered with toluol and allowed to stand eighteen hours. As a control an equal amount of the same active thyroid extract was taken at the same time, added to an equal amount of the same starch solution as that of the test, covered with toluol, and allowed to stand for eighteen hours. At the expiration of this time the action was stopped by boiling both test and control, the protein was removed, and the contents of the test tubes tested by means of a standard Fehling solution for the presence of sugar. The amount of sugar was then calculated. A much larger per cent of sugar was found in the solution to which the ground extract of worm had been added than in the one containing only active thyroid extract plus water. All experiments gave similar positive results. The ground extract was capable of vigorously converting the starch solution to sugar, from which it is to be concluded that the enzyme which breaks down starch is present in the body of the tapeworm.

Live worms removed from the intestines of dogs were placed in distilled water and washed thru from two to five waters. The wash water was then tested for antidiastase. In some cases the live worms were placed in active thyroid extracts for from one-half to two and one-half hours and then removed. As controls boiled worms were used. The experiments in greater detail were as follows: There were measured out in carefully labeled test-tubes equal amounts of active thyroid extract. The first served as a control; to the second were added live worms; to a third boiled worms; and to a fourth the water the worms were washed in. Where live worms were used they were removed after one-half to two and one-half hours as stated above, and all test-tubes were made up to equal volumes by the addition of distilled water. Then an equal amount of a one per cent soluble starch solution was added to each of the test-tubes and they were allowed to stand for the same length of time, generally, at room temperature, over night. All tubes were covered carefully with toluol. When ready to test the protein was removed by the addition of sodium hydroxide and zinc sulphate which does not interfere with the action of Fehling. Filters were always carefully washed and the filtrates made up to equal volumes. Five cubic centimeters of fresh standard Fehling solution diluted to one-fifth strength for each test were heated to boiling in a porcelain dish, and the solution to be tested was titrated into the boiling liquid. This was then boiled again, always less than two minutes, and for accuracy the exact point of reduction of the copper oxide was tested with a potassium iodide starch solution as an indicator.

TABLE I

Summary of experiments to determine the presence of antidiastase in tapeworms from dogs

SETS OF EXPERIMENTS	Composition of solutions tested	Average amount of sol. required to reduce 5 c.c. diluted Fehling	Amount of inhibition
1	2	3	4
I. Control.	Thyroid extract	12.5 c.c.	....
Test ...	Thy. ext. plus live worms	16 c.c.	+4.5 c.c.
Test ...	Thy. ext. plus 5th wash water.	19.75c.c.	+7.2 c.c.
II. Control.	Thyroid extract	9.1 c.c.	....
Test ...	Thy. ext. plus live worms	12.66c.c.	+3.56c.c.
Test ...	Thy. ext. plus boiled worms	8.5 c.c.	—0.6 c.c.
III. Control.	Thyroid extract	6.3 c.c.	....
Test ...	Thy. ext. plus live worms	7.55c.c.	+1.2 c.c.

These results are brought together in Table I. A reference to column 3 will show that in the first set of experiments it required 12.5 c.c. of the control solution to reduce 5 c.c. of the dilute Fehling. The like mixture in which live worms had been allowed to remain for about two and one-half hours showed a lessened ability to reduce Fehling, inasmuch as 16 c.c. were necessary to reduce the same quantity of Fehling. Furthermore, the fifth wash water was still more antidiastatic in that 19.75 c.c. were required to reduce the 5 c.c. of Fehling. These figures are mean results obtained by three or four trials in each case. The conclusion may be drawn that live tapeworms give off to the solutions or liquids in which they are placed substances that inhibit the diastatic action of thyroid extracts. The second set of tests shows that boiled worms do not have this property. A similar statement may be made of dead worms. The worms, if allowed to stand for twenty-four hours in distilled water, covered with toluol, undergo autolysis. However, the liquid contained no trace of sugar. When live worms were placed in starch solutions for from twelve to twenty-four hours, sugar was always present in the solution. Apparently the worms contained active diastase. As shown in the first set of experiments in the table the inhibiting agent seemed to be more active or more abundant in the water in which the worms had been washed than when the worms are used directly, and thus it appears that the agent may be of the nature of a secretion from the outer surface. In the third set of experiments the worms remained in the thyroid extract for one hour only.

THE BULLETIN
OF THE
UNIVERSITY OF NEBRASKA
COLLEGE OF MEDICINE

HENRY B. WARD, Dean, Lincoln **HAROLD GIFFORD, Associate Dean, Omaha**

THE BULLETIN is published quarterly in January, April, July, and October, by the University of Nebraska, at Lincoln, Nebraska

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Single numbers of the BULLETIN may be had for 50c each. Complete volumes or subscriptions by the year $1.00

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EDITORIAL

On April 24, 1908, the Board of Regents voted to establish a school of pharmacy in the University of Nebraska. Appropriations were made for an instructor in pharmacy, pharmacognosy and dispensing and for material and apparatus necessary for practical instruction in these subjects. The office and new laboratories will be equipped during the summer months and will be ready for work with the opening of the University in September. This action of the University authorities can not but commend itself to the pharmaceutical profession of the state and to the medical profession as well. It means the establishment of a school whose aim will be to increase the efficiency of pharmaceutical training, the elimination, as far as possible, of the commercial aspect of pharmacy, and the elevation of pharmacy as a profession. During the last two or three decades commercial interests have so dominated both medicine and pharmacy that it has become a matter of common knowledge that the average physician is a prescriber and the average pharmacist is a dispenser only of patents and proprietaries. The country has been recently aroused by a campaign against these wrongs led by prominent lay, pharmaceutical, and medical men. As a result of the interest aroused concerning the manufacture, sale, and distribution of drugs and poisons, and the passage of national and state laws relative to pure food and drugs, pharmacy, pharmaceutical chemistry, and allied sciences have been given an importance never before enjoyed. To those who have watched the recent developments in the medical and the pharmaceutical worlds it is evident that it is necessary for the two professions to cooperate in order to accomplish the greatest good, not only for themselves but for the people whom they serve. Therefore the School of Pharmacy hopes to cooperate with the College of Medicine in every possible way in order to improve medical and pharmaceutical education in Nebraska and the Middle West.

R. A. LYMAN.

The Alumni Reunion

During the recent session of the American Medical Association in Chicago the alumni of the University of Nebraska College of Medicine met in reunion at a dinner on the evening of June 2. It was the occasion for a family gathering, and the attendance was gratifying to those who came a distance to meet old classmates and fellow alumni.

Dr. Henry B. Ward was made impromptu toastmaster, and, as none other could, added zest to the already overflowing enthusiasm.

Almost intuitively the spirit of the gathering drifted to the affairs and well-being of the medical department, better known to the older alumni as the Omaha Medical College. It was with genuine interest they learned from the active members of the faculty, the broad university plane upon which the college had been placed, of the progress it is making and its high standing at home and abroad. It was evident to a casual observer there was hardly a day passed that every man present did not have an opportunity to feel proud of being a graduate of the University of Nebraska School of Medicine, and to possess an inherent hope and desire to add something to the sum total of her achievements. Especially noticeable was the sentiment to establish and endow an alumni research fellowship that would live for all time. Much stress by many speakers was given the value of original work in upbuilding and sustaining a place among the leading institutions of learning; indeed, it was not alone a sentiment, as evidenced by pledges of material aid. Undoubtedly another alumni meeting will see definite plans formulated, and it is believed the movement will find many willing supporters. One would not need to be told the graduates of the University of Nebraska are in a large measure leaders in the states in which they practice and can well afford, for their own and the credit of their alma mater, to erect such a monument.

There were no guests of honor, altho we were honored by the presence of Dr. H. M. McClanahan, of the faculty, Mrs. W. A. Chapman, Dr. F. A. Long, of Madison, Nebraska, Dr. P. H. Salter, of Norfolk, Nebraska, and Drs. H. W. Orr, R. A. Lyman, and A. E. Guenther of the faculty.

Others in attendance were: Drs. G. L. Strader, Cheyenne, Wyoming (Nebraska), 1899; A. C. Stokes, Omaha, Nebraska, 1399; F. A. Graham, Lincoln, Nebraska, 1889; H. B. Lemere, Omaha, Nebraska, 1898; C. J. Miller, Ord, Nebraska, 1905; H. G. Thomas, Greenville, Ohio, 1896; S. J. Burwell; E. S. Putnam, Sioux Falls, South Dakota; A. A. Robertson, Crescent, Iowa, 1901; C. H. Root, Bassett, Nebraska, 1903; Henry Benson, Glenwood, Iowa, 1903; John Reid, Pilger, Nebraska, 1902; W. A. Chapman, Hastings, Nebraska, 1902; L. G. Hill, Watertown, South Dakota; J. A. Johnson, Byron, Illinois, 1894; G. C. Shockey, Melrose Park, Illinois, 1901.

G. C. S.

The arrangements were admirable and reflected the greatest credit on the energy and good judgment of our representative on the local committee, Dr. G. C. Shockey.

ED.

COLLEGE NOTES

Francis J. Perusse, Ph.C., of the University of Kansas, has been chosen as instructor in pharmacy, pharmacognosy and dispensing in the School of Pharmacy.

Dr. J. C. Iversen, '03, and Miss Catherine Smith, both of Palmyra, Nebraska, were married June 9, and left immediately for a tour thru Colorado and the West.

Dr. R. A. Lyman attended the Nebraska State Pharmaceutical Association, held at Omaha, June 16, 17, 18. He was a delegate from the Nebraska State Medical Association.

Dr. R. A. Lyman, director of the School of Pharmacy, recently visited the universities of Iowa and Kansas, and the schools of pharmacy in Chicago and St. Louis, in the interest of the School of Pharmacy of the University.

Dr. F. D. Haldeman, of Ord, Nebraska, who has been spending the winter with his wife and son in southern California, returned to Nebraska after the Atlantic fleet reached the Golden Gate.

The following extract from a letter received from Dr. McKean is of interest:

Chiengmai Hospital and Dispensary,
Chiengmai, Siam, May 30, 1907.

Dr. Mason is a very great help to us. He and wife are doing well in the language. He is doing most of the surgery and doing it well.

Very sincerely yours,
J. W. McKEAN.

The articles of incorporation of the Sunlight Sanitarium Company were filed yesterday afternoon in the office of the county clerk. The incorporators are C. W. M. Poynter, H. Winnett Orr, and Irving S. Cutter. The company is capitalized at $50,000 and has property worth $20,000. The objects of the corporation are to operate and maintain a pathological laboratory and to publish hospital bulletins and reports. I. S. Cutter will have charge of the publications, which are a unique feature of an institution of this kind.

One of the most pleasant events connected with the meeting of the Nebraska State Medical Association which met at Lincoln this spring was a gathering of the alumni and faculty of the University of Nebraska College of Medicine on the 19th of May. About sixty persons gathered in one of the private dining rooms of the Lindell hotel at the noon hour, and were served to an elegant course dinner, after which various toasts were responded to by prominent faculty members and alumni. A spirit was manifested by all which bodes well for the future of the College of Medicine, and it is to be hoped that this kind of an affair may become a feature of the annual meeting of the State Medical Association.

At a recent meeting of the Board of Regents, Dr. H. Winnett Orr, for five years connected with the medical faculty, was advanced to the grade of adjunct professor. Dr. A. E. Guenther was also advanced to the grade of professor of physiology, and Dr. R. A. Lyman to that of professor of pharmacodynamics.

It was also voted to accept with regret the resignation of Dr. W. H. Christie from the chair of therapeutics on account of poor health. In view of the long service which Dr. Christie has given the College of Medicine, and in view of his public and professional standing, he was appointed professor emeritus by the Regents. The report of Dr. Christie's death soon after was received with feelings of sincerest regret by his colleagues.

It was further voted that Dr. H. LeRoy Crummer, B.S. Michigan 1893, M.D. Chicago Medical College 1896, Interne St. Barnabas Hospital, Minneapolis, 1896–97, postgraduate work Vienna, Berlin, London, 1900, Vienna 1902, Frankfort 1904, Vienna 1907, be appointed to the chair of therapeutics.

The annual alumni luncheon of the College of Medicine was held at the Chesapeake in Omaha on commencement day, May 21. It was the largest and most enthusiastic meeting ever held. About seventy-five people were present. Many important matters were discussed, the most important one being the consideration of the advisability of establishing a research scholarship in the College of Medicine by the alumni. A committee was appointed to investigate the matter and report at the next annual meeting. The movement has the support of the majority of the alumni, and we hope that such a step will be taken and we know it will have the support of every loyal Nebraskan.

The members of the class of 1908 of the University of Nebraska College of Medicine have located as follows:

A. A. Fricke, interne in the Methodist Episcopal hospital, Omaha, Nebraska; J. B. Grinnell, in partnership with his brother, Dr. J. R. Redfield, Wood River, Nebraska; J. J. Hompes, assistant to Dr. E. B. Woodard, Lincoln, Nebraska; E. C. Hayman, interne in the Douglas County hospital, Omaha, Nebraska; W. H. Henney, Thedford, Nebraska; T. J. Kerr, interne in the Methodist Episcopal hospital, Omaha, Nebraska; Charles Lieber, interne in the Swedish Mission hospital, Omaha, Nebraska; B. B. Miller, Tabor, Iowa; J. C. Moore, Jr., interne in the Methodist Episcopal hospital, Omaha, Nebraska; F. H. Morrow, Columbus, Nebraska; D. B. Mulliken, Munson, Kansas; G. W. Prichard, interne in the Immanuel hospital, Omaha, Nebraska; Fred Premer, Bartley, Nebraska; C. Rubendall, interne in the Immanuel hospital, Omaha, Nebraska; L. T. Sidwell, interne in the State Feeble-Minded Institution, Glenwood, Iowa; E. D. Skeen, Woodbine, Iowa; G. W. Sullivan, Kimball, Nebraska; H. A. Taylor; S. L. Taylor, Hoopston, Illinois; C. C. Tomlinson, interne in the Douglas County hospital, Omaha, Nebraska; I. L. Thompson, Beemer, Nebraska; G. H. Walker, resident physician at the Sunlight Sanitarium for children, Lincoln, Nebraska; H. P. Wekesser, Lincoln, Nebraska.

The sixth annual commencement of the University of Nebraska College of Medicine, marking the twenty-seventh year of the clinical department in Omaha, was very successfully held on Thursday evening, May 21, at the Congregational church, Nineteenth and Davenport streets, Omaha. The program was as follows:

Music—Allegretto .... Wolstenholme
Martin W. Bush, Organist.
Invocation.............................By the Chaplain of the Evening
Rev. Daniel Edwards Jenkins, D.D.
Music—Intermezzo in D Flat....................................Hollins
Administering of Hippocratic Oath and Presentation of Candidates
Dean Henry Baldwin Ward.
The Conferring of Degrees
Chancellor Elisha Benjamin Andrews.
The Commencement Address,
"Prophylaxis—The Great Work of the Physician."
Harvey Washington Wiley, Ph.D., LL.D., Chief of the U. S. Bureau of Chemistry, Washington, D. C.
Benediction ....By the Chaplain
Postlude—Marche Aux Flambeaux..........................Guillmant
Informal Reception for the speaker, alumni, graduates, and invited guests, in the church parlors.

EXCHANGE
OCT 2 1917

VOL. III OCTOBER 1908 No. 4

THE BULLETIN

OF THE

UNIVERSITY OF NEBRASKA

COLLEGE OF MEDICINE

PUBLISHED QUARTERLY BY THE UNIVERSITY

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LINCOLN, NEBRASKA

APPLICATION MADE FOR ENTRY AT THE POST-OFFICE AT LINCOLN, NEBRASKA, AS SECOND-CLASS MATTER UNDER ACT OF CONGRESS, JULY 16, 1894

CLINICAL FACILITIES

OF THE

University of Nebraska College of Medicine

- The College Dispensary
- The Nebraska Methodist Hospital
- The Immanuel Hospital
- The Douglas County Hospital
- The Clarkson Memorial Hospital
- The Wise Memorial Hospital
- The Child-Saving Institute
- The Jennie Edmundson Hospital
- The Tinley Rescue Home

DR. W. H. CHRISTIE

Emeritus Professor of Materia Medica and Therapeutics,
University of Nebraska College of Medicine

Died May 28, 1908

THE BULLETIN
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VOL. III *OCTOBER 1908* No. 4

The School of Pharmacy of the University of Nebraska and What It Means to the Medical Profession[1]

BY RUFUS A. LYMAN, LINCOLN, NEBRASKA

I have been asked by the secretary to say a few words concerning the subjects mentioned in the title of this paper. I can best get at the substance of my remarks by calling to your attention the status of the pharmacist in the United States.

We often hear the complaint, coming usually from the rank and file of the pharmaceutical profession, that the pharmacist is not duly recognized as a professional man. The question arises as to what constitutes a professional man.

The Standard Dictionary gives the following as the definition of a profession: "An occupation that properly involves a liberal education or its equivalent, and mental rather than manual labor, especially one of the so-called learned professions." The professions referred to are religion, law, and medicine. These were regarded as learned by all ancient nations and the idea is retained to this day. But the definition does not exclude other vocations, the essentials being a liberal education and some special mental training or some special dicipline which leads to special attainment and culture. Thus, teaching, acting, writing, engineering, pharmacy, or the art and science of war may logically be considered as professions if the training has been such as to conform to the above mentioned requirements.

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[1] Read before the Alumni Association of the University of Nebraska College of Medicine, September 30, 1908.

There are today approximately 50,000 pharmacists registered in the United States. Barring a very small per cent, they can not be called professional men, because the ability to read and write and to pass the examination of the average state board of pharmacy, coupled with two or three years' experience in a drug store, does not constitute a liberal education; neither is it indicative of a scholar, a scientist, nor a man of culture.

The factors responsible for this deplorable condition of affairs in American pharmacy are many. I shall mention a few.

The state laws governing registration of pharmacists are very lax. In the case of medical registration every physician knows it is no longer an easy matter to register for the practice of medicine. So rapidly have requirements been raised in recent years that it is questionable if the majority of the rank and file of the medical profession could practice today if they were compelled to reregister and live up to the requirements demanded by our state examining boards.

You may or may not know the low standards required of applicants to practice pharmacy in our own state by the examining board, but unless you have made the matter a subject of special study you do not know how universal these conditions are. Up to date only two states, New York and Pennsylvania, have passed laws requiring candidates for registration to practice pharmacy to present a diploma from a school of pharmacy.

Practically all states require an applicant for registration to have served as "apprentice" in a drug store for a varying number of years. This would seem to indicate that the state boards consider the two or three years' apprenticeship of more value than a school training. This, of course, is absurd, for the apprentice receives no systematic instruction, either didactic or experimental. In fact, in most cases his employer is in no position to give him instruction even if he were disposed to do so. In other words, the apprentice in a drug store is left to get what he can "pick up." I am not saying that the apprentice system of training did not have its value at one time. At one time excellent, it is now obsolete. It is comparable in a way to the old preceptor method of medical teaching, which was unsurpassed before the advent of graded medical instruction and the laboratories and hospital wards of the modern medical school. Likewise, the modern school of pharmacy offers facilities for didactic and laboratory teaching which are essential.

Again, pharmacy as a profession is domineered over and swallowed up by pharmacy as a business. In pharmacy as in medicine the commercial aspect must always play a rôle, and rightly so. For while our professional ideals must be something other than dollars, we must supply ourselves and those dependent upon us with the substances necessary for the maintenance of normal metabolism. Commercialism has, however, in recent years, invaded pharmacy even to a greater extent than medicine. The patent medicine business and the prescribing of proprietary medicines by the medical profession at large has been largely responsible for the pharmacists' downfall. It is so evident that it needs no discussion how this practice of the physician must necessarily drive the pharmacist to become a mere vendor of patents and proprietaries or make him change his vocation, which is not always an easy thing to accomplish, however much he may desire to do so.

A traditional gulf lies between the physician and the pharmacist. Many excuses have been offered for its existence. Some attribute it to the fact that physicians prescribe nostrums, others maintain it is because physicians dispense their own drugs, and still others say it is because the pharmacist does more prescribing over the counter than the physician does in his office, and so on. While these facts may be causative factors to some extent, they can not explain existing conditions, and we must look in some other direction. I have mentioned the fact before that the pharmacist is wont to complain of his lot, that he is not considered professionally the equal of the physician. But why should he be so considered? Let us answer the question by studying for a moment the conditions in our own commonwealth. In Nebraska an applicant for registration to practice medicine must present to the examining board evidence of having completed a four-year high school course and evidence of having completed a course of medical instruction in a recognized medical school. On the other hand, an applicant for registration to practice pharmacy is not required to have any high school training or even a grammar school training and no training is required in a school of pharmacy. Before taking the examination the only requirement asked is evidence of three years' experience in a drug store. Until the pharmaceutical profession of our state demand requirements for the practice of their profession equivalent to that demanded of medical aspirants, they can not command the respect of either the medical profession or the public.

It must be remembered that there are many cultured men in the pharmaceutical profession, who have organized a national association, the American Pharmaceutical Association, and thru this and its local branches are putting forth every effort to elevate their vocation and improve their profession and practice. This association, in conjunction with the American Medical Association, is doing much toward bringing harmony into the ranks of both professions. This means increased efficiency in both professions and better service for the public.

Pharmacy is a profession which concerns public health as vitally as does medicine. The opportunities in the private practice of the profession, in the various industrial and manufacturing pursuits, and in the government service are unlimited. The awakening going on in both professions and the interest manifested by the public resulting in the enactment of pure food and drug laws bodes well for the future of pharmacy.

Realizing the shortcomings of pharmaceutical training in our territory and believing that the influence of the University should be felt in every walk of life, the Chancellor some time ago appointed a committee to investigate the advisability of organizing a school of pharmacy in the University of Nebraska. The present school is the result. The object of the school is to give a training which will make competent pharmacists, food and drug analysts, chemical and physiological assayists, workers with and helpers of, and not competitors of physicians, to promote the interests of pharmacy, which will at the same time promote the interests of medicine and the public, to raise the entrance requirements for the study of pharmacy and stimulate legislation which will improve the standard of the profession, to emphasize the professional side rather than the business side of pharmacy, to raise pharmacy to the dignified position it should occupy, to put into practice the high ideals of the leaders of pharmacy and the allied sciences; in short to make men of culture and attainment. Evolution and not revolution must be our policy. Progress in the face of the conditions I have pictured must necessarily be slow, but will be most rapid when persuasive and not antagonistic measures are used. The attitude that representative men of both professions take is most inspiring. Government officials tell us that the time is not far distant when the government will require men to have the bachelor's degree to be applicants for the important positions under the food and drugs act, in the governmental laboratories, as inspectors at the ports of entry, and for positions in the army, navy, and marine hospital service. This is one indication of the trend of the times.

In things pharmaceutical we request and in fact expect especially the cooperation of the graduates of the College of Medicine. If the School of Pharmacy reaches its ideals, and it will, it is evident what it means to the medical profession of our state as well as to the pharmaceutical profession and the public as well.

London as a Medical Center

BY H. M. M'CLANAHAN, OMAHA, NEBRASKA

Wherever the physician may decide to spend his time in postgraduate work in Europe he should at least pay a brief visit to London, not only the largest, but in many ways the most interesting city in the civilized world. In extent and variety of clinical material London has the advantage over any other great medical center. After visiting Vienna, Berlin, and Paris I am surprised that London is not more highly appreciated by American physicians. The marked objection to London for the study of medicine as compared with Vienna is that there are no private laboratories and no teachers giving private instruction or even instruction in small classes.

It was my impression before going abroad that a physician in middle life desiring to improve himself in the scientific branches as well as in clinical study would do well to divide his time between Vienna and London. I am now satisfied that this opinion is entirely correct and I have no hesitancy in saying that a physician would do well to first go to Vienna, review or renew his knowledge in the microscopical branches of medicine and also in the small classes for personal instruction in such branches as he may select, then go to London for pure clinical work.

A physician in going to London will have difficulty in ascertaining where work is to be found. There is no society there as in Vienna for giving information. The hospitals are widely scattered over that great city, and valuable time is lost in going from one to another. I met two physicians from New England who had spent eight days in London without accomplishing anything, in some cases arriving at the hospital only to find that the clinics had closed for the day. I recommend that a physician going to London for study first decide upon some hospital, then go there and arrange work, and after he has become well established he will find hours when he may visit other hospitals with profit.

I would suggest that a physician first visit Louis' book store on Gower street. This is not only a medical book store but there is a department of secondhand books and also a splendid library.

By the payment of one pound he can have the use of the library for three months and withdraw one book for use in his room, and then at the end of the three months will have a considerable amount of the deposit returned to him. I found it advantageous to spend one or more hours a day in the library in study where it was possible to procure almost any book of reference and to follow out a subject very fully. Also he will be able to get valuable information here as to the location of the various hospitals. The London *Lancet,* which is on file, contains each week a directory of the hospitals and clinics. It is my belief that most physicians doing post-graduate work do not spend enough of time in real study, but depend too largely upon observation. One or two hours spent in careful study will add very much to the value of the post-graduate work.

Near Louis' is the London Polyclinic on Cheeny street. This institution was founded by Jonathan Hutchison and contains his magnificent collection of charts and casts illustrating skin diseases. It also contains an excellent laboratory where physicians may receive instruction in microscopical work at moderate cost. There is a very good library here, too, which any one taking the ticket is entitled to use. A fee of one pound entitles the visiting physician to attend all clinics and lectures. There is a lecture and clinic held here for five days a week from 4:00 to 6:00 P.M. The lectures, on a variety of subjects, are given by men prominent in London and England. These lectures are arranged and advertised in advance. It was my privilege to hear Clifford Allbutt and other prominent physicians. Any physician expecting to spend three months in London would, in my judgment, do well to take out the ticket admitting him to the lectures and clinics in this institution.

University Hospital is only two or three blocks away. This is one of the largest and altogether the most modern hospital in London. It occupies a very large block of ground. There is a central square building, from each corner of which extends a wing admitting of a large amount of light and air to the various wards. There is daily held here a large ambulatory clinic. It was my privilege to attend one ward clinic in this institution given by Sir Thomas Barlow, a man of charming personality, and also a clear and incisive clinical teacher.

The undergraduate department of the University of London is immediately across the street from the hospital. The buildings occupy three sides of a hollow square, the open court looking to the street. The central building is of Greek style of architecture and very imposing, the front of the building being supported with immense fluted columns of granite. It was here one evening that I witnessed the arrest of a number of the undergraduate students because of their razing the statue of the little brown dog which was placed in one of the parks of London by the Anti-vivisection Society as a protest against vivisection. This incident aroused a good deal of unfavorable criticism in the daily press against medical students.

St. Mary's Hospital is interesting because it contains Wright's laboratories. The laboratories occupy a portion of two floors. There are a number of waiting rooms where patients may receive treatment. It was my privilege at one of my visits to personally meet Dr. Wright. He impressed me as a hard, earnest worker filled with enthusiasm without personal ambition for success beyond what he may achieve in his laboratory work. A limited number of students are admitted to this course, but only those who are thoroly trained in bacteriology and haematology can be admitted to the course. I am satisfied that as the result of the work of Wright and of the pupils who will go out from there much valuable information will result to scientific medicine, and that in the years to come his work will be accorded a place in medical history along with that of Pasteur and Koch. His work does not receive the credit in London that it merits and I thot of the Scripture saying: "A prophet is not without honor except in his own country." I heard much in praise of Dr. Wright and his work in Vienna and Berlin, but usually only criticism in London.

The London Hospital in the White Chapel district should be visited. Probably the largest dermatological clinic in the world is to be found in this hospital. On the second floor is a large room devoted to the treatment of skin diseases, especially epithelioma and lupus, by means of the Finsen light. This room is about forty by sixty feet in size. There are suspended from the ceiling eight immense arc lamps. From each arc, the light passes thru a water drum to sift out all the heat rays. From the drum the light passes thru four tubes, each tube directing the light for the treatment of one patient, so that each arc supplies light for four patients, making a total of thirty-two patients that can be treated at the same time. It is necessary to have a nurse for each patient, who is required to hold a quartz lens over the part to be treated, each treatment lasting from one-half to one hour. The quartz lens is used because the Finsen light, which is the ultra-violet light, will not pass thru glass. This is said to be the largest plant anywhere in the world.

The National Hospital for Epileptics on Queen's Square is an institution of international renown. My information pertains only to the dispensary department. Here clinics are held four afternoons a week, conducted by James Taylor, Sir Risien Russell, Mr. Turner, and others. These clinics include a wide variety of nervous diseases. There are also held in the amphitheater, twice a week, lectures by members of the staff, well worth the time of any physician. I recall an illustrated lecture by Sir Risien Russell on syringomyelia. The stereopticon pictures of the section of the cord made an impression upon the mind never to be forgotten. No one can attend these clinics without realizing in what high esteem Sir William Gower is held by his associates. It was indeed pleasant to realize that a man still living could have the respect and cordial good-will of his fellow men.

My time was given almost entirely to the study of diseases of children at the Hospital for Sick Children, Great Ormond street. Here it is possible to give almost the entire day to the study of this branch of medicine. Each forenoon a dispensary clinic is held in the basement, and the average number of children attending is from two hundred to three hundred a day. These cases are first looked over by a resident physician, and the more interesting ones are selected for presentation by the attending physicians. This work is largely done by Drs. Still, Hutchison, and Poynton. Dr. Still is well known for his investigations in the bacteriology of meningitis, and English people recognize a form of basilar meningitis as Still's disease. Dr. Hutchison is recognized as an authority upon the blood of the new-born. Dr. Poynton is well known for his original work upon the cause of rheumatism. He is the author of the article in Osler's recent System of Medicine.

The surgical clinic, which is going on at about the same time, is under the direction of Mr. Waugh. The opportunities here for the study of orthopedics and the diagnosis of joint lesions are excellent. During three afternoons a week clinics are held in the eye, ear, nose, throat, and teeth. These clinics are not well attended by visiting physicians, and deserve more attention than they usually receive. Minor operations, including circumcisions, adenoids, tonsils, and the removal of tumors by electrolysis are done here daily. I clearly remember having seen twenty-one circumcisions in one afternoon.

Post-mortems are held daily at 1:30 P.M., and average from two to four a day. I was surprised and disappointed at the limited number of physicians in attendance at the post-mortem room and was impressed as never before with the practical value of this work. No one can attend here daily without realizing that mistakes in diagnosis can occur with the best of men. The major operations in this institute are done in the large amphitheater on the fifth floor. Mr. Lane is the chief surgeon. He is well known in this country, principally because of his treatment of cleft-palate.

The work in the wards is under the direction of Drs. Garrod, Battin, and Volckner. The visiting physician has the opportunity of going thru the wards from bed to bed with the attending physician, and I think any one from this country will be impressed with the fact of the prevalence of rheumatism and heart disease in England. I doubt if anywhere there can be found an institution where the opportunities for studying diseases of children, both for variety and number of cases, are as good as in this splendid old hospital.

No physician visiting London should fail to go to the Royal College of Surgeons at Lincoln's Inn Field. This large and historic old institution contains a museum that in extent and variety is not excelled anywhere. The extensive library and reading room is upon the second floor. The museum, occupying three floors of a very large building, is divided into a number of departments. The anatomical museum alone will repay many hours of study. Here are to be found carefully dissected sections of the various parts of the human body preserved in natural color in large flat glass jars so arranged that they can be seen distinctly. Here with the aid of Gray's Anatomy a person can spend hours in study almost to as great an advantage as in a modern dissecting room. The department of comparative anatomy is interesting, but the pathological display, including all varieties of morbid growths, is beyond anything that I have ever seen. The section devoted to skin diseases is replete with unique and interesting specimens.

I have briefly spoken of the above institutions only in so far as I had personal knowledge. There are many other hospitals and clinics in London that I did not even visit. The enormous amount of clinical material in London may be more fully realized when we stop to consider that London is a compact city, occupying an area of twelve miles in diameter and containing nearly six million people. It is estimated that one-third of the inhabitants, or two million, receive gratuitous treatment at the hospitals and clinics of London. If there were the facilities for doing laboratory work, and if there were teachers willing to take small classes or give private instruction, as there are in Berlin and Vienna, then in that event I have no hesitation in saying that London would not only be the largest, but in every way the best medical center in the world.

Report of a Semester's Work in Operative Surgery

BY A. C. STOKES, OMAHA, NEBRASKA

Our work for the last semester, 1907–1908, in operative surgery on dogs, has been eminently satisfactory to the instructors. We held fourteen operative exercises in which all forms of operations were completed with as much care in technic as is possible to impress upon the students. Our chief aim was the teaching of technic, and this we tried hard to emphasize. This course is elective and open to juniors. Ten students registered for the course, making two squads of five each.

Nothing of any particular moment worth mentioning transpired in the ordinary operations, such as appendicitis operations, gall-bladder operations, intestinal operations, brain operations, etc. However, during the course we encountered five cases of surgical pathology in dogs. It is the report of these five cases which I consider the most valuable part of the exercises outside of the direct instructions which the students received, and outside of the deductions which we were able to make from our work on fractures, published in another place.

The five pathological conditions consist of the following: two cases of umbilical hernia, one case of ununited fracture, one case of simple goitre, one case of hypertrophic sclerosis of the liver. The two cases of umbilical hernia were brought to us thru Mr. Pixley of Omaha. We found in each case a small mass protruding thru the umbilical opening. The hole appeared to be about the size of one's little finger. The mass which protruded was about the size of a small walnut, and disappeared when the dog was laid upon its back and returned when the dog was standing.

Dog number one was operated upon by the writer, and upon going thru the skin and deep fascia, we found ourselves within the canal of the umbilical cord, separated only from the abdominal cavity by the peritoneum. The muscles and muscular fascia did not cover the canal. The hernia was evidently a central umbilical hernia. Our operation was done as follows: an incision was made thru the skin and deep fascia, after which we entered the lumen of the canal. We isolated the sack from the walls of the canal, ligated and excised, and dissected out the edges of the recti muscles from the deep fascia, imbricating the deep fascia over the umbilical opening; next imbricated the muscles, then sewed the superficial layer of the fascia of the rectus with a continuous cat-gut suture. The skin and superficial fascia closed in an ordinary fashion.

The second dog was operated upon in the same way by Dr. Robert Hollister, my colleague in this work. Umbilical hernia is common in dogs. Veterinarians usually cut thru the skin, push the peritoneum back, cauterize the edges of the canal, sew it together; this is the operation. The intra-abdominal pressure in an animal walking on four legs is much less than the intra-abdominal pressure of an animal standing upright, consequently the amount of resistance is much less. However, it does not seem very scientific, and the same rules which we have worked out for operation for umbilical hernia on human beings should be carried out on dogs.

A case of ununited fracture was a fracture of the humerus of some weeks' standing. It was cut down upon, the edges freshened, the bone bored thru and tied together with number three twenty-day chromacised cat-gut. The wound was closed and dressed and placed in a plaster cast. Convalescence was uneventful, and on the fourteenth day the cast was removed. The dog walked lame for more than two weeks, after which there was nothing further to be observed. The two notable features of this case was the uniting of the bone with the suture, and the use of plaster of Paris.

We have been taught in surgery from time immemorial to use wire, nails, or some suture that was not absorbable. Little by little we are coming to the belief that we are able to obtain better results by the tying together of bone by sutures which are absorbable in from fifteen to twenty days. The philosophy of the thing is simply this; that after the first five or six days, any bone will form a provisional callus which will be sufficiently resistant to hold the bone in approximation if it was in approximation before this. Much literature might be cited upon this point, but in this short period we will only say in passing that our chromacised cat-gut suture gave good results in this case. The second point of the discussion is the use of plaster of Paris following operations for fractures. The experience of this case and of numerous other cases in dogs makes us believe that the use of plaster of Paris for the first few days, or perhaps a week after the fracture, has very many disadvantages, to say the least. In dogs who can not be well controlled it is absolutely necessary to use it. In human beings, however, it would seem to the writer from his experience with these animals and with his own work on human beings that plaster of Paris casts following the operative treatment of fracture is, as a general rule, not to be used in any fracture of long bones. In some joint cases it might be of value, particularly in the hip and knee, altho it has its disadvantages here. If plaster is used at all immediately after the operation it should be put on very loosely. We may remark incidentally in this connection that our experience in operative treatment or the so-called open treatment on dogs has been rather against the use of this method as a general statement; even in a dog which resists infection greatly a large per cent of these fractures become infected. A more extended discussion will be found in the proceedings of the State Medical Society of Nebraska for 1908.

The fourth pathological case was that of a dog in which there was a large goitre. The goitre was removed by Mr. Sayer, a senior medical student, under the direction of the writer. The ordinary Kragenschnitt of Kocher was made, and the superior and inferior thyroid arteries tied. The operation offered no incidents; it is not very difficult. The veins around the thyroid gland of the dog are larger than those in a human being and were, therefore, more easily tied off, and the tumor was somewhat easy to control. The goitre was not examined microscopically, but a macroscopic diagnosis proved the goitre to be filled with a number of small isolated tumors in a fibrous tissue capsule, which could be easily enucleated from the thyroid gland proper. Within the tumor was an ordinary gelatinous non-dializable semi-fluid material; in other words, the goitre was a simple cystic goitre.

These goitres are very common among dogs. So common that one can easily, in a walk of several blocks, see dogs with goitre. The exact per cent I do not know. They are usually in dogs well along in years, from seven years upwards. They seem, so far as the writer has observed, to be equally common in males and females, somewhat more common in dogs which are well fed and well cared for than in those of the cur type. We have not seen any exophthalmic goitres as yet. I am informed that they occur occasionally. Hemorrhagic cysts occur occasionally in dogs. Cushing reports three cases.

The fifth and most interesting case of all was a case brought into the dog hospital in Omaha, very much emaciated, with a very much dilated abdomen filled with fluid. He was also a very small dog, weighing about twenty pounds, and was a wanderer, apparently having no home. The dog was chloroformed and the abdomen opened to discover, if possible, the pathology within. When the peritoneum was opened there was seen a large quantity of fluid of a straw color, clear, homogeneous, specific gravity of 1006, and which contained 1 per cent of albumen. About two liters of this material escaped. The abdominal contents were thoroly examined, everything was found to be normal except the liver, which was about twice the size of a normal liver. It is rather hard to just exactly say what a normal liver under such conditions would be, but the liver in this case occupied all the right hypochondriac region, extending nearly to the umbilicus below and over to the spleen on the left side. It would be easy to say that the liver was twice the normal size. The dog was killed with chloroform and sections of the liver taken for examination. The author saw the slides, and found a typical "Laennec hypertrophic sclerosis." It is a well-known fact, of course, that hypertrophy and atrophy of the liver in human beings is quite largely due to either alcoholism or syphilis, this not occurring in dogs in any case. The writer was anxious to work out the etiology, and in this respect a talk with Professor Kinsley, professor of pathology in Kansas City Veterinary College, led to this understanding,—that both atrophic and hypertrophic sclerosis occur occasionally in dogs, but usually only among dogs who are of a low type and who have no home, and live around town from garbage barrels and refuse thrown from hotel kitchens, restaurants, and private houses. This being a fact apparently well known among veterinary men leads to the possibility that any form of toxemia to which an organism is constantly subjected may produce a sclerosis, and if our observations could be carefully noted we might find cases of sclerosis of the liver in the human, not due to either of the above cases, but possibly to constant indiscretions of diet or constantly loading the organisms with some toxic material, which fact is of course not new, but I sometimes think not sufficiently impressed.

Our experience with this work last year has given us a stimulus for observations of diseases in other animals beside man. It has been an invaluable aid to the instruction of students in technic and will be continued the second semester of this year in a somewhat modified form from last year, with considerable improvement.

Tuberculosis in Children[1]

A BRIEF REVIEW OF SIXTY-SEVEN PAPERS READ AT THE INTERNATIONAL CONGRESS ON TUBERCULOSIS, WASHINGTON, D. C., SEPTEMBER 28–OCTOBER 3, 1908

BY H. WINNETT ORR, LINCOLN, NEBRASKA

The spirit of the Tuberculosis Congress of 1908 was that of a student with a difficult problem which he has determined to solve. With reference to the subject of tuberculosis in children, as in other departments of the congress, the discussion was largely of ways and means to stamp out the tuberculosis we have at present in children and to prevent the development as far as possible of new cases in the future.

Nominally, one section of the congress was set aside for the consideration of tuberculosis in children; but practically, papers were read in all of the seven sections bearing upon this particular phase of the question.

For the purpose of this review I have selected from abstracts of the papers, all of which deal with the various forms of tuberculosis which appear in childhood, and with the problems which are particularly the problems of tuberculosis in the young. These I have classified in a general way as follows: 1, those dealing with the problems of the transmission and etiology of tuberculosis; 2, diagnosis; 3, symptoms; 4, pathology; 5, prognosis and various forms of treatment of the different manifestations of the disease in infancy, closing with a reference to the institutions for the care of tuberculous children reported at the congress.

The prevailing sentiment thruout the papers reviewed is in favor of an educational and hygienic campaign in which, while the physicians must be the leaders, those of the laity who are able to do so must take an active part.

In general it has been found that about 7 per cent of infants under one year are infected with tuberculosis. This percentage gradually increases to the fourteenth year—probably 10 per cent of all children succumb to this disease—doubtless a majority of these, needless victims of inadequate protection from infected parents or contaminated food.

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[1] Read before the Pathological Club of the University of Nebraska College of Medicine, September 10, 1908.

Crafer in his paper, No. 15,[1] pointed out that in general, tuberculosis has a higher death rate in the foreign born than in the native population and called attention to the reasons for the same. An investigation by him into the homes of persons dying of tuberculosis showed that more than half lived in poor or very bad sanitary environments, while only about 8 per cent had lived in what could be called excellent surroundings. He emphasized what has already been pointed out many times, that congested districts show the largest death rate.

La Fetra, No. 20, reported an analysis of 130 hospital cases of tuberculosis in children. He called attention to the large percentage of unfavorable results in tuberculosis in children, and argued in favor of careful medical supervision of children in tuberculous families and patient instruction of the parents in methods of prevention.

Guilfoy, No. 25, gave a statistical report bearing upon the distribution of tuberculosis in the different years of life.

von Pirquet, No. 49, whose more important paper on the diagnosis of tuberculosis will be referred to later, reported 1,400 examinations to determine the prevalence of tuberculosis in childhood. He advocated that an effort be made to compile international statistics based upon the examination (testing reaction to tuberculin) of school children of all ages, as a result of which he thought it would be possible to segregate those who are dangerous to their fellows and hasten the stamping out of tuberculosis in our schools.

In a paper by Anders, No. 1, an argument was made in favor of insisting upon education of the young to cultivate and increase their bodily health and vigor. This he considered as important a part of the campaign as an effort to do away with the infective agent.

The influence of heredity was made the subject of three papers, Nos. 56, 57, 58, in which consideration was given both to the possibility of the transmission of the hereditary tendency and the development of tuberculosis in the young from association with their tuberculous parents.

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[1] Refer to numbered bibliography at end of this paper.

Warthin read a paper, No. 61, on the placental transmission of tuberculosis, and presented specimens in the pathological exhibit illustrating this comparatively rare condition. He insisted that placental transmission must be retained as a definite factor in the etiology of infantile tuberculosis.

A paper by Copeland, No. 13, emphasized the predisposing influence of the acute infectious diseases and one by Courmont and Lesieur, No. 14, pointed out the possibility of the germs passing directly thru the skin, pointing out that infection probably occurs thru the hair follicles.

Opposed to the hereditary view, which so long held the attention of the profession, a series of papers, Nos. 35, 23, 12, 41, 51, were read pointing out the effects of association with infected adults in the development of infantile tuberculosis. It was shown how much larger a percentage of the children born in tuberculous families and reared by them acquire the disease than others of any class, however unfavorably situated in other respects.

Comby, No. 12, makes the flat assertion that tuberculosis is in no sense a hereditary disease, and in a general way the evidence of the other papers along this line were strongly in support of this view.

Knopf, No. 35, reiterates the doctrines of prevention which he has so successfully advocated.

Other papers along the general line of domestic hygiene, emphasizing the importance of sanitary surroundings, infection-free food, and the necessity for upbuilding the physical resistance of children were read, Nos. 4, 29, 43, 59.

One group of papers, all read in section five of the Congress, Nos. 28, 31, 55, 65, 26, were devoted to an encouragement of instruction of the young along the lines of hygiene, sanitation, and particularly definite instruction in schools and colleges in regard to the tuberculosis problem. One writer, Stiles, No. 55, argued for the establishment in the schools of a public health week. This suggestion was the outcome of his experience as an officer of the Public Health and Marine Hospital Service, in connection with which he has been traveling in the South, instructing both the old and young in regard to methods of preventing tuberculosis and infection with the hook worm disease.

Norton, No. 44, also read a paper on the relations of colleges to the crusade against tuberculosis, a relationship which he deemed of the greatest importance because of their influence while instructing teachers to be later supplied to the schools.

Baumel, No. 5, urged compulsory examination and treatment in all public institutions where by reason of association with other children they become subject to supervision of public officials.

More papers than on any other subject were devoted to the diagnosis of tuberculosis particularly in the young. Wolff-Eisner, No. 66, read a paper on early diagnosis, mentioning as particularly valuable the conjunctival reaction to tuberculin and discussing in some detail the varying character of the results obtained by this method. He claims priority for the announcement of this reaction, his communication having appeared in May, 1907, while the work of Calmette was not reported untii one month later.

The ophthalmo-reaction to tuberculin is made the subject of a number of papers, Nos. 2, 3, 10, 37, 53. The paper read by Calmette himself, No. 10, reports that of about 3,000 patients clinically tuberculous, 92 per cent gave positive reactions. After a review of the comparative advantages of the conjunctival and cutaneous reactions to tuberculin, he concludes that in spite of its inconvenience the conjunctival test is to be preferred for children over one year and for all adults. He concludes also that for comparative purposes in hospitals a simultaneous employment of both tests is to be recommended.

The cutaneous reaction of von Pirquet was made the subject of three papers, Nos. 5, 22, 50. The last paper was read by von Pirquet himself and reviews his work in the examination of two hundred post-mortem examinations of children previously tested for the cutaneous reaction to tuberculin. Of sixty-eight cases positive to the von Pirquet skin test while living sixty-six showed definite tuberculous lesions post-mortem.

Detre read a paper, No. 17, which was one of the features of the congress. He offered not only valuable evidence to support the use of the von Pirquet reaction to tuberculin as a diagnostic measure, but has succeeded by the use of special preparations of tuberculin from the bovine and human types of bacilli in distinguishing, so he claimed, between the two types of infection in children. Detre gave a demonstration at the children's hospital in Washington where, by means of the cutaneous test, different kinds of tuberculin being used on different parts of the skin at the same time, he secured reactions in some to the bovine and in some to the human tuberculin. He claimed to be able to distinguish by this means not only between the two types of infection but also to be able to discover when an individual was infected at the same time with both types of the tuberculous organism. The procedure was recommended as a diagnostic measure and for its value as a preliminary procedure to the use of tuberculin in treatment. After this procedure the form of tuberculin to be used should correspond to the type of infection found to be present.

Sondern; No. 54, read a paper on lumbar puncture as a diagnostic procedure in tuberculous meningitis.

Along the lines of general pathology of tuberculosis in children papers were read on the relation of the teeth to prognosis, No. 47, on primary localization, No. 30, and on the distribution of the lesions in tuberculous children, No. 67.

The involvement of lymphoid tissue in tuberculosis, No. 42, and the involvement of lymph glands, No. 52, were also made separate topics of discussion.

Craig, No. 16, gave the points upon which a prognosis of tuberculosis in children may be based. He called attention to the fact that older children give better results than younger, and patients treated in sanatoria better than those treated in dispensories or hospitals. He stated that incipient tuberculosis in the young is more apt to recover than in adults, but that when the disease is at all advanced the results in children are not so good.

Tuberculosis of the bones and joints in children was thoroly discussed. Kertesz, No. 34, gave an elaborate histological report of the beginning of tuberculous processes in bones.

Tuberculous lesions in the knee and hip, Nos. 38, 62, and a discussion of the relation of orthopedic surgery to tuberculosis, No. 33, tuberculosis of the pericardium, No. 60, meningeal tuberculosis, Nos. 21, 36, all received due attention in the different sections.

Dinwiddie, No. 18, who reported the results of a series of experiments to determine the susceptibility of cattle to the surgical forms of human tuberculosis, concluded that the theory that surgical forms of tuberculosis are regularly of bovine origin received no support from his experiments.

The hyperemic treatment was made the subject of one paper, No. 39, Meyer concluding that in every tuberculosis sanatorium a ward should be set aside for adults with bone tuberculosis in which this method could be used.

Surgical tuberculosis was made the subject of a paper by Bradford, No. 7, and by De Forest Willard, No. 63. Willard emphasized the methods to be used and the excellent results so far obtained by the outdoor treatment of these patients.

Ochsner, No. 45, reported results obtained by carefully regulated vaccine therapy, and Beck, No. 6, gave a valuable report of the further results obtained by the bismuth vaselin injection method first devised by him during the present year. In connection with his paper he presented a collective report of cases treated during the past five months in which a number of very gratifying results had been obtained.

The use of tuberculin in surgical tuberculosis was also made the subject of a paper by Philip, No. 48, of Edinburgh, who believes it to be a valuable agent in conservative surgery.

The surgical treatment of tuberculous cervical glands was made the subject of two papers, Nos. 19 and 40, which were along the lines already generally followed.

The use of Mosetig paste to fill tuberculous bony articular cavities was reported as having been used in twenty-six cases, No. 32, with very good results.

The importance of efficient immobilization in tuberculous arthritis was discussed by Codivella, No. 11, and Wilson, No. 64, who stated in considerable detail the methods used to obtain satisfactory fixation and the necessary preliminaries to be observed before plaster of Paris or apparatus is applied.

The value of children's playgrounds and gardens was emphasized by Mrs. Henry Parson, No. 46, and the advantages pointed out of combining hygienic instruction with such measures.

Illustrated reports were presented by Brannon, No. 8, of the work at the Sea Breeze Hospital and by Gillette, No. 24, at the State Hospital for Crippled Children in Minnesota. These institutions are accomplishing each in its own way an enormous amount of good, largely along the lines of work followed at the Hospital for the Ruptured and Crippled in New York city, the orthopedic clinic at the Post-Graduate Hospital, New York, the Boston Children's Hospital, the Institute for Destitute Crippled Children in Chicago, and other institutions of the same class. The author of this communication being a Nebraskan can not refrain from commenting upon the fact that the Nebraska Orthopedic Hospital, while not represented at the International Congress, has adopted and is following successfully the lines of work which have been so satisfactory in these other, larger institutions.

There can be no doubt but that the entire subject of tuberculosis in children has received at this Congress an impetus which will carry the work rapidly forward from this time on. As indicated in the very brief abstracts presented, the entire range of human endeavor along this line received encouragement and support at the hands of those who participated in the affairs of the Congress. Methods of diagnosis no less than treatment are being standardized to the very great advantage of the children who suffer from this disease, and the active and efficient men who are engaged in this work give promise of magnificent attainment in the immediate future.

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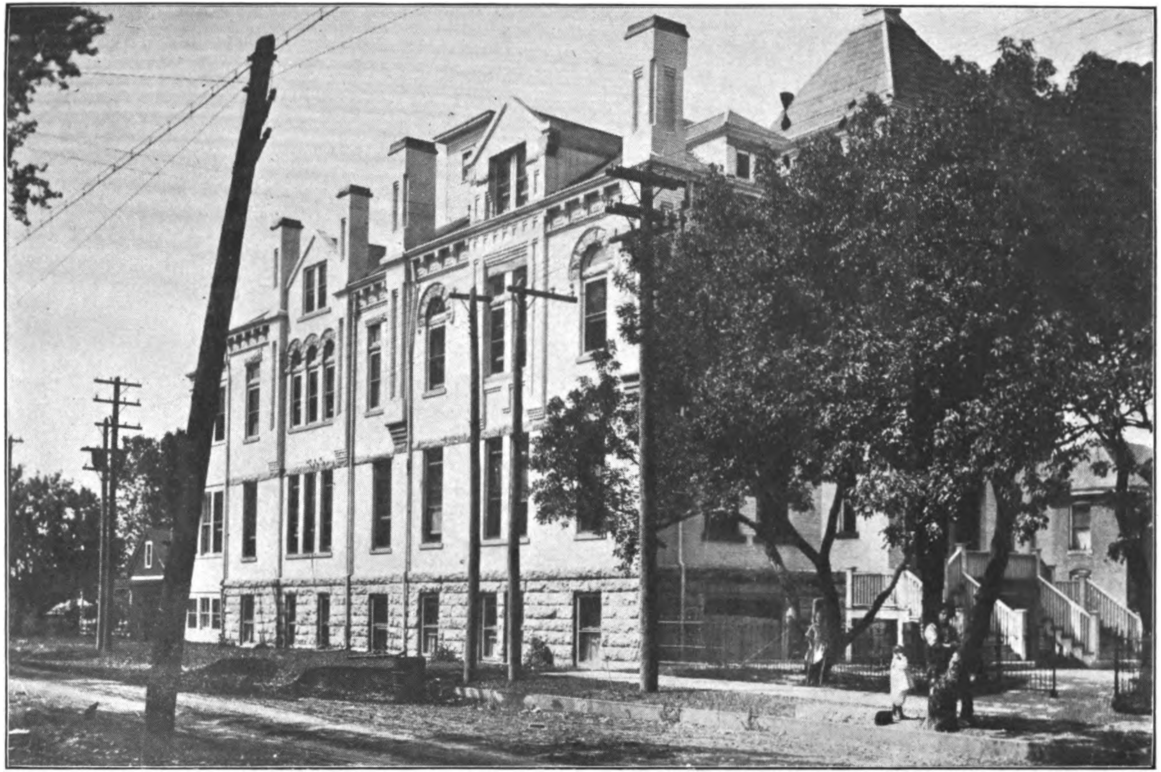
PLATE I



THE NEBRASKA ORTHOPEDIC HOSPITAL.

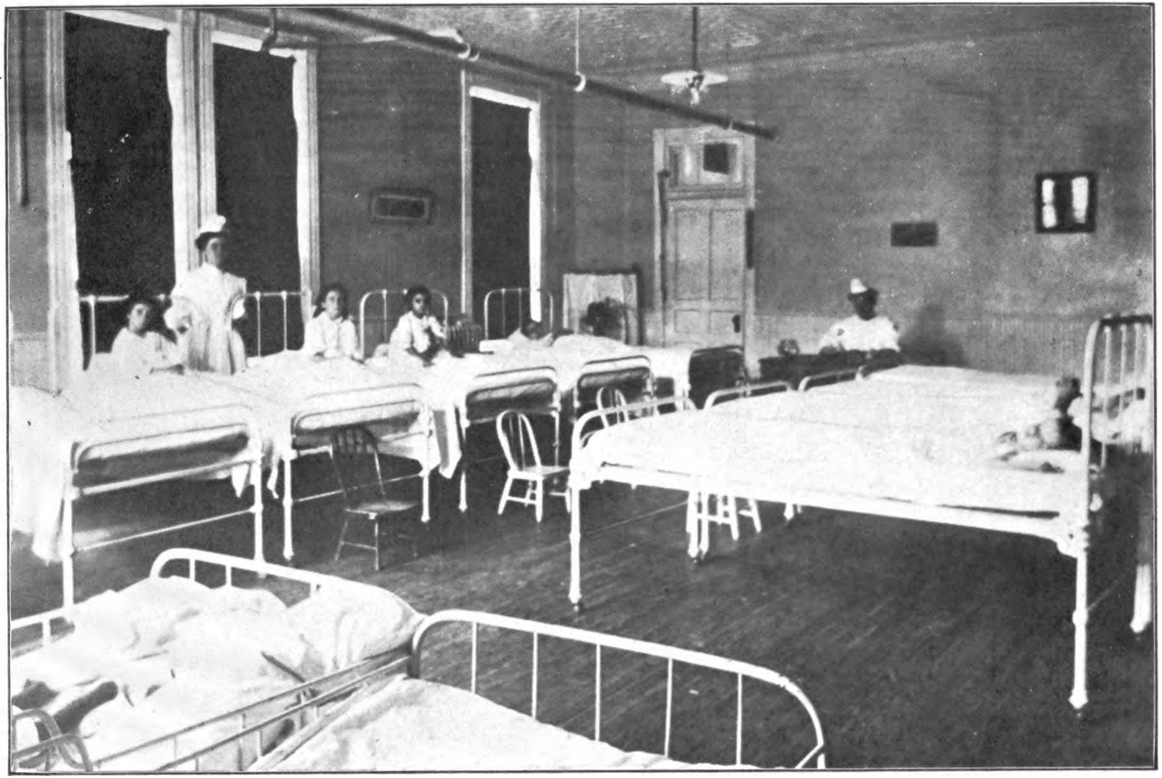
Space in this building was set aside for the hospital by the legislature of 1905. The hospital now occupies the entire basement and the second and third floors, which have been remodeled and converted into entirely modern hospital quarters. An electric push button elevator has been installed and the building otherwise completely equipped.

PLATE II

A GROUP OF PATIENTS IN THE HOSPITAL YARD TAKEN IN AUGUST, 1908.

The first patients were admitted October 1, 1905. The entire number cared for during the first period ending November 30, 1906, was the equivalent of about 8,000 hospital days. For the second period ending November 30, 1908, patients have been cared for the equivalent of almost 25,000 hospital days.

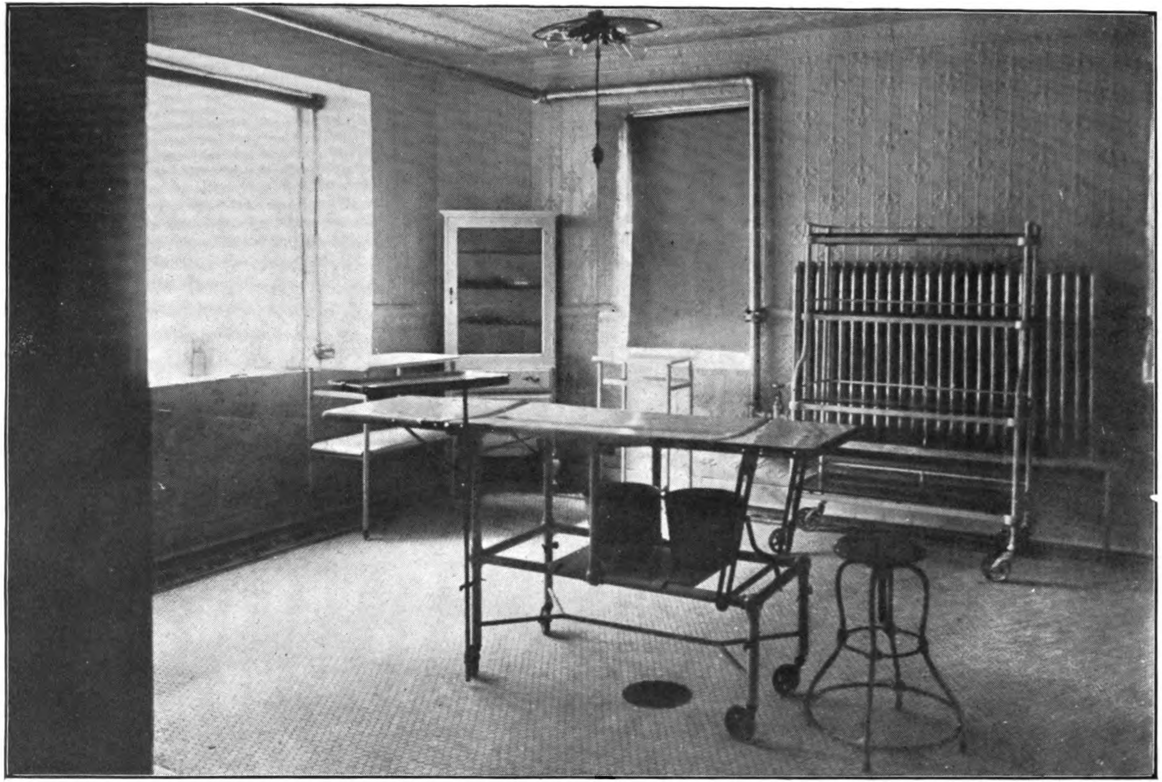
PLATE III



THE GIRLS' WARD

On the second floor is one of two wards almost exactly alike. This ward will accommodate about eighteen beds and is used for sleeping quarters or for patients who are only temporarily bed patients. Chronic bed patients are as far as possible given beds in the solarium at the south end of the building.

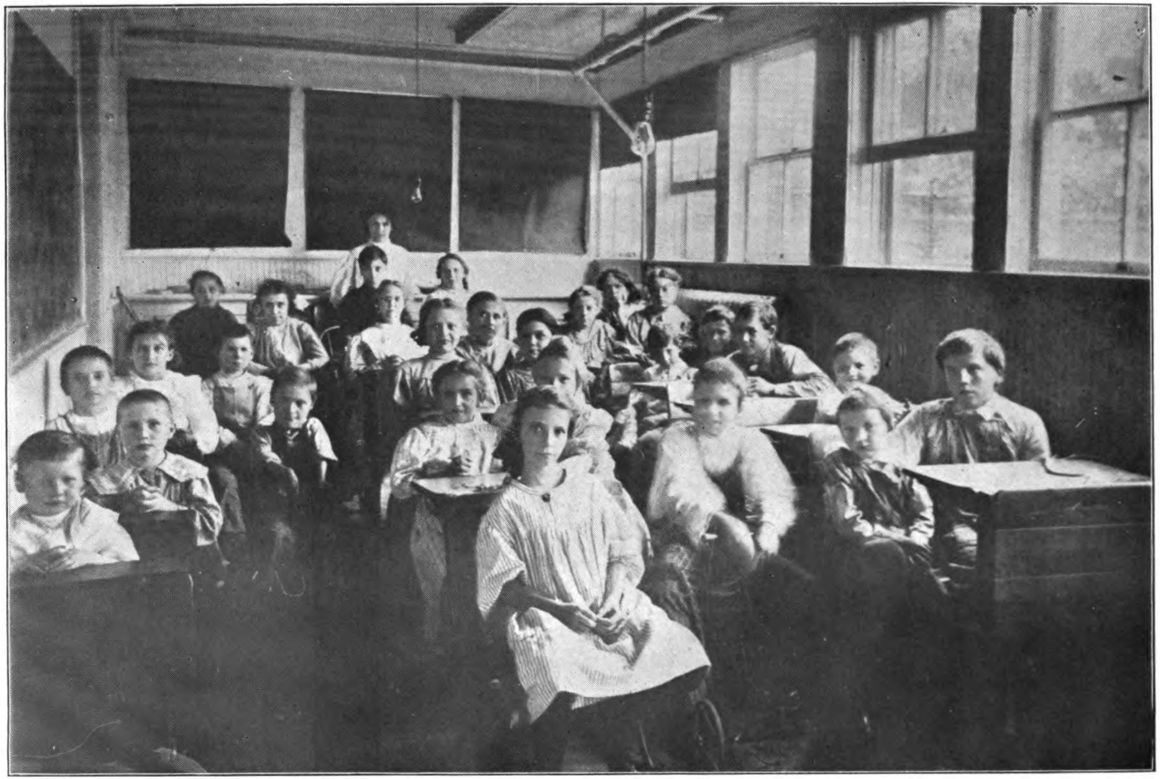
PLATE IV



THE OPERATING ROOM

In the northeast corner of the basement is finished and equipped in the most approved modern fashion. During the period since the opening of the hospital something more than 200 operations have been performed.

PLATE V



THE SCHOOL ROOM

Grammar school work and instruction in basket weaving, lace making, clay modeling and other branches of manual training are regularly carried on in this schoolroom, which is the basement portion of the solarium. Those children who are confined to their beds are provided with suitable instruction in such work as they are able to carry on.

Some Recent Discoveries Regarding Trypanosomes and Sleeping Sickness

BY HENRY B. WARD, LINCOLN, NEBRASKA

Among all the diseases which have come into attention in recent years no one has a more remarkable history than sleeping sickness. Nearly a century ago the first cases were noted among slaves imported into Brazil and the West Indies. The disease seems to have been confined originally to a limited region on the equator near the coast of West Africa, extending only a few miles in any direction. Today it has spread thruout the entire Congo basin to Central Africa, thru Uganda and the Sudan, and as far as Portuguese and German East Africa. It is found now as far north as Bahr-el-Ghazal and as far south as Cape Colony. More than that, this tremendous spread over the entire width and almost the entire length of a great continent is chiefly a matter of a score of years. With the recent establishment of great trade routes thru Africa and the movement of exploring parties and caravans back and forth across long distances this disease has spread like a prairie fire thru the country. The opening of the Dark Continent and rapid transit have made of a relatively insignificant disease a continental scourge.

Unfortunately the limit has not yet been reached. On this point recent investigators are unanimous. It is certain that sleeping sickness will continue to spread in Africa with the opening up of the country and the consequently increased movement of natives over long distances, until its dispersal is coextensive with that of the tse-tse fly. It is also clearly the duty of Europeans to do all that is possible to prevent this extension of the disease which largely results from their presence.

The cause of the disease is a minute blood-inhabiting protozoon of the flagellate type known as *Trypanosoma gambiense*. In the blood it gives rise to the clinical symptoms classed together as trypanosome fever. Later the parasite makes its way into the cerebrospinal fluid and there excites the symptoms known as sleeping sickness or West African lethargy. While possibly seen earlier, this organism was first recognized as such in 1901 by the

English investigator, J. E. Dutton, who later sacrificed his life in the effort to solve the problem of the disease. Somewhat similar parasites occur in many other hosts, and certain of the species are the cause of epidemics which ravage domestic animals in various regions. Among such diseases are the surra of India, the mal-de-caderas of South America, the nagana of Africa, and the mal-du-coit found among horses in southern Europe and introduced into our own country. It is important to note that the species which causes human trypanosomiasis has never been found in the blood of any other host. Its reported occurrence in horses, cattle, and other animals is due to confusion with the similar parasites mentioned above, which in fact are perfectly distinct species. To be sure Koch is said to have discovered the human species in the blood of the crocodile which infests the shores of Victoria Nyanza, but the indefinite preliminary announcement has not been confirmed and is improbable at least. It has been established experimentally that the various trypanosomes are transmitted from host to host by the intervention of blood-sucking flies, and for the human host the tse-tse fly (*Glossina palpalis*) functions as vector. Some investigators regard the tse-tse fly as a purely mechanical agent, but others look upon it as an intermediate host in which the parasite passes thru certain parts of its life cycle. If the latter alternative be true, the fly will play in this disease precisely the same rôle as the mosquito in the malaria. Minchin has demonstrated clearly that the parasites live only a short time in the proboscis of the fly and that during this period they can be inoculated into a new host. There remains much to be determined before the exact agency of the fly in transmitting the disease can be stated; now only this much is fixed: the disease is transmitted primarily if not exclusively by this single species of tse-tse fly.

The rapid spread of the disease, together with its terrible fatality, makes it of tremendous economic importance, and nations holding colonial possessions in Africa have rushed scientific expeditions into the field to solve the problems it offers. Commissions appointed by England, Germany, France, and Portugal have done splendid work in determining the infected area, means of transmission, and associated factors. The Schools of Tropical Medicine at Liverpool, London, Hamburg, and Paris have, on their own initiative, put into the field investigators who sometimes at the cost of their own lives have worked out the pathology of the disease and have made extended experiments on its treatment. Last spring a second International Congress on Sleeping Sickness met in London and established a bureau with headquarters in that city for education, investigation, and prophylaxis under international cooperation. As prophylactic measures the villages of the natives will be moved away from stream banks where the tse-tse flies are most abundant and the infected are to be isolated in central lazarets guarded by troops to prevent their escape. The task is tremendous and is rendered more serious by the difficulty of diagnosing early cases and by the concealed opposition of the natives to such quarantine measures.

Many measures must be employed, but the most important one, and that which offers the greatest hope of absolute success, is believed to be quarantine. Its efficiency will be dependent upon the application of gland palpation supported by other methods of examination to detect early cases. Thru it some persons will doubtless be wrongly suspected, and will suffer inconveniences which must be supported; other cases will doubtless remain undetected. It is believed that the number of cases which will escape diagnosis by this method is exceedingly small, and if a nominal percentage does escape, that is no reason why the huge percentages which may be detected by it should be allowed untramelled intercourse with uninfected countries when such frightful examples of the result of such uncontrolled emigration already exist in the sleeping sickness epidemics of Uganda and the Congo Free State.

Of the probable outcome of the disease Todd says that advanced cases may be expected to die within three to six months. Cases in which only a few symptoms of an indefinite nature are observed live for about a year. Cases which seem apparently well, and in which, on continued examination, nothing can be found save slight, irregular, intermittent fever and enlarged glands, may live for very long periods, but they commence to die in a year, and two-thirds of them die within three years.

Recent extensive investigations which have been carried out in foreign research laboratories with the primary object of ascertaining some mode of drug cure for sleeping sickness and other trypanosome diseases have resulted in demonstrating certain features in the biological conduct of these protozoa towards chemical stimuli which are of extreme interest. Thus far only three groups of chemicals have been discovered which are at all efficient in the treatment of trypanosome infections. They are: (*a*) benzidin dyes, (*b*) basic triphenyl-methane dyes, and (*c*) arsenical compounds. In experimental animals complete cure has apparently been effected by maximum doses of these compounds. With lesser doses and prolonged treatment the parasites may disappear from the blood for a time, but later on make their appearance again. Those which recur have undergone a pronounced change in their biological characters and constitute a strain resistant to the therapeutic agent employed. Such a strain manifests chemo-resistance of a specific character towards the particular substance used to develop it and an increased resistance towards other compounds of the same group. On the other hand, the development of resistance towards one group causes no increase whatever in the resistance towards other groups. By continued experimentation, however, a strain has been produced manifesting a triple resistance.

Chemo-resistance once acquired persists unchanged, while the resistant trypanosomes are passed thru normal animals even for one hundred and forty transfers extending over fourteen months. This has been cited as strong evidence of the transmission of acquired characters. As Gifford has pointed out this means rather the origin of a resistant strain by artificial selection. The specificity of the resistance is very striking. After an experimental animal has been inoculated with a mixture of two resistant strains and is then treated with a substance towards which one of the elements is resistant, the other element will disappear from the blood, but the resistant strain will remain and develop unchecked. Indeed the two strains remain separate and capable of isolation after repeated passages thru infected animals. Or, in other words, a strain with double resistance or with modified resistance does not arise as the result of infection with a mixture of two resistant strains.

Arsenical preparations have been most extensively used in treatment of trypanosomiasis. Koch regards the therapeutic value of atoxyl as demonstrated and holds it to be specific in this disease. Heavy doses do cause the trypanosomes to disappear for thirty to forty days, but in some cases at least they return, and the final outcome is uncertain. Atoxyl followed by mercury perchloride is said by others to give better results than atoxyl alone. The severe effects are probably due to a toxin produced by the parasites, which induces serious and even permanent changes in nervous tissue, so that the entire destruction of the trypanosomes would be unavailing in the later stages of the disease. The parasite and with it the disease may be transmitted to the chimpanzee and some monkeys, and in them one can observe all the characteristic features of the disease recorded for man. The results of experiments on such animals and also of the administration of drugs to man must be accepted with great caution since in many cases the disease is prolonged and a positive verdict regarding the outcome of the experiments can not be given until a long time has elapsed. The number of cases under consideration in such experiments is naturally small and the disease is known to have been prolonged as much as seven years before death ensued where no medical measures were taken.

Game as well as native African cattle and other domestic animals are supposed to acquire in some cases a tolerance for certain strains of trypanosome. From conditions in Gambia, where sleeping sickness has been endemic for more than a century, some investigators are led to believe that many may acquire a similar tolerance for *Trypanosoma gambiense,* but so far as positive evidence goes the outcome of the disease is universally fatal. The former supposed racial immunity which whites enjoyed has proved to be only greater freedom from infection on account of the use of clothing and of other habits that reduce the chance of fly bites to a minimum. As little dependence can be placed upon supposed immunity, racial or acquired, as upon the various types of drug treatment so highly commended by some investigators.

The Physiological Aspects of Shock[1]

BY A. E. GUENTHER, LINCOLN, NEBRASKA

In an attempt to form a conception of the altered physiological functions which are involved in the clinical expression "shock" one is met at the outset by a looseness of application of the term and by an array of contradictory symptoms which are confusing. Apart from conditions which follow acute infection, inspissation of the blood, fat embolism, etc., there are apoplectic shocks, cardiac shocks, deferred shocks, epigastric shocks, erethismic shocks, fetal shocks, mental shocks, paralytic shocks, secondary shocks, sense shocks, sexual shocks, surgical shocks, testicular shocks, torpid shocks, and traumatic shocks. These may be slight and transient, profound and at times fatal. The slight or transient conditions seem to be closely allied to syncope, in which, with a transitory loss of consciousness, heart and respiration show no marked disturbance. The prodromal symptoms which usually precede syncope, such as dizziness, ringing in the ears, darkening of the visual fields, are absent in shock. In the more profound conditions there exist weakened energy of heart beat and irregular breathing, which lead to a decrease of body temperature and in a diminution of gaseous exchange, so that the venous blood of persons dying of shock is lighter in color than normal blood (Roger quoted from Ziegler). Consciousness is usually preserved, the skin and visible mucous membranes are pale, the pulse is often irregular or intermittent. In severe shock the prostration may amount to immobility or coma. With sunken countenance and evidences of weakness of sensory and motor functions, death takes place from stoppage of the heart and cessation of the respiration. But a depression of vital activity is not an invariable accompaniment of shock. In the so-called erethismic shock the patients are restless and excited,—they groan, shriek, and complain of a fearful anxiety associated with dyspnea. This complex of symptoms has, obviously, fundamentally, an alteration of the central nervous system as its basis. Given such an alteration, primarily, the various other symptoms characteristic of clinical shock may follow secondarily.

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[1] Read before the Pathological Club of the University of Nebraska College of Medicine.

As early as 1850 Marshall Hall wrote, "If in a frog the spinal marrow be divided just behind the occiput, there are, for a very short time, no diastaltic actions in the extremities. The diastaltic actions speedily return. This phenomenon is shock." He, however, was not the first to describe shock, since this phenomenon had been reported by Whytt a century previous without giving it a special name.

It is a very striking condition as seen in the frog. The animal is completely flaccid. The injury to the central nervous system has given rise to a depression of nervous function which passes away only gradually; *pari passu,* the ordinary reflexes which had been abolished, reappear.

Shock appears in a great variety of animals, very characteristic in the higher but becoming less and less distinct in descending the animal scale until shock is with difficulty separable from inhibition phenomena. Among animals that may be used in the laboratory it is said that shock is most pronounced in the monkey, where it forms a serious experimental difficulty in the study of spinal reflexes. As studied in this animal, spinal shock appears to take effect in the aboral direction only. It makes but very slight difference whether the cord is sectioned in the dorsal, lumbar, or sacral region. Each section is followed by equal degrees of depression, but the area involved differs, of course, as far as the number of segments is concerned. Sherrington states:

"A section below the brachial enlargement hardly disturbs the reactions of the upper limb altho the number of channels running headward thru the tracts of Goll, Burdach, Flechsig, and Gowers, which are sectioned in such a case, are enormous, and the impulses sent cephalad must produce tremendous stimulation of structures placed at higher levels. A striking example of the absence of a headward spread of depression is given when the transection takes place just below the level of the fifth cervical segment. In such an instance the respiratory activity of the phrenic motor cells is hardly affected tho they lie in such close proximity to the cut. The depression on the aboral side of the section is profound. Let it be clearly borne in mind that the cutting off of all the stream of centripetal impulses which are continually passing up the cord from cutaneous, articular, and muscular sense organs of the tail, limbs, trunk, and viscera and which serve for conscious and unconscious elaboration in the brain does not disturb the reactions of the head or brain.". According to Sherrington, if the section lie below the brachial region the animal will, immediately after section, "direct its gaze to sights seen thru the window or may amuse itself by catching flies on the pane." The aboral direction taken by shock seems to be universal in the nervous system. According to Loeb, the head-half of the worm Thysanozoon continues its movements of progression almost undisturbed by a quick cut across its middle. If, in the bee, while sucking honey, the abdomen is suddenly severed from the remainder of the body, it will rear itself for a moment and then continue sucking.

A very interesting contrast results from high cervical sections in the monkey and in the cat. In the former a tendency to drop off to sleep develops itself, but it is unlikely that this is due to any depression of nervous activity resulting directly from the section, but is due rather to the coincident fall of arterial blood-pressure and of body temperature. A similar transection in the cord of the cat leads, not to a depression, but to an exaltation of nervous function, so that the region of distribution of the trigeminal becomes hyperesthetic. A similar condition seems to be present in Astacus, judging from Bethe's experiments. The differences thus observed in the two classes of animals bring to mind forcibly the two kinds of clinical shock which stand in most vivid contrast—the torpid and the erethismic shock.

Sherrington in the article on the spinal cord in Schaefer's Physiology, vol. II, p. 846, gives the following account of the resumption of nervous activity following spinal shock. "For an hour or so it may be difficult to elicit any reflex movement from the skin innervated behind the transection, whether by mechanical, thermal, or electrical stimuli. An apparently crossed reflex is, at least in my experience, among the earliest obtainable, namely, the crossed adducter reflex and the crossed 'knee-jerk.' An early reaction to emerge from the spinal shock is adduction-flexion of the hallux, in response to stimuli applied to the third, fourth, and fifth digits (plantar surface or sides) or to the skin of the sole, especially on its fibular side. The movement of the hallux is then slight and often tremulous. A similar reflex is obtainable in the hand. In the cat and dog and rabbit an equivalent reaction seems to be the arching of the digits, and this is not unfrequently bilateral. Anal protrusion in response to stimulation of the skin of the perineum, feeble abduction of the tail on pricking it, are also reactions which early emerge from the depression. The limbs at this time feel limp and the muscles more flaccid than they do later. Gradually these reflex movements become more vigorous and others are added, e. g., the cremasteric and the drawing up of the limb on stimulation of the foot. Extension of the limb is late to be obtained, and very rarely is obtained as a primary homonymous reaction. Crossed reflexes appear, and the march and duration of the individual reflexes get more extensive. The disappearance of shock is very variously rapid in different individuals. In the same animal the progress is usually not steady; on some days reflexes are absent which had been gained and reappear only later. The extensors of the hips and knees recover later than the flexors. In the spinal dog after brachial transection it can perhaps be said that in five weeks the depression of shock has usually worn off. It is not renewed by a second transection practiced behind the first one."

From a physiological point of view the most interesting phenomena in connection with shock are those that have to do with the provocation of movement in apparently reactionless limbs. Sherrington is authority for the statement that it can be especially well seen in the monkey that the motor root cell, tho in spinal shock profoundly inaccessible to stimuli applied via skin or afferent nerve trunks, lies perfectly open to any applied via the pyramidal paths. Also, excitation—mechanical, or by weak electric currents—of the central ends of the spinal afferent roots readily evokes reflex movements, tho far stronger stimuli fail absolutely when applied to the skin and afferent nerve trunks. This most extraordinary result can only be speculated upon at present.

By Goltz shock was looked upon as a collection of inhibition phenomena. With reference to this interpretation Sherrington in the *Integrative Action of the Nervous System* states: "The argument implies, if it does not explicitly state, that the trauma, by its damage and by its subsequent processes of inflammatory reaction, formation of scar tissue, etc., acts as a stimulus, exciting inhibition that depresses or suppresses reflex activity in adjacent and even remote arcs of the central nervous system. Against this explanation militate several facts. Firstly, the shock takes effect almost exclusively in the aboral direction. Were the mere irritative action of the trauma the cause, it is not easy to see why the nervous centers near the trauma should not be depressed on either side of, for instance, a spinal transection, headward as well as backward. Secondly, experiments of the following kind give results difficult to reconcile with the view. When in the dog complete transection of the spinal cord thru the eighth cervical segment is practised, a severe fall in the general arterial blood-pressure ensues, and vaso-motor reflexes can not be elicited. But in the course of some days this is largely recovered from, and after some weeks the blood-pressure will, with the animal in the horizontal position, often be found practically normal. When the animal is then anesthetized and curarized, artificial respiration being maintained, it is usually easy to obtain on stimulation of the central ends of the divided afferent or mixed nerves, for instance of the internal saphenous nerve, good and often very large vasomotor reflexes, the blood-pressure rising fifty millimeters or more. These reflexes upon the vascular musculature are purely spinal, since the cord has been divided just headward of the thoracic region. Then, while these spinal vaso-motor reflexes are regularly elicitable and serve as a guide to the reflex activity of the cord behind the transection, I have transected the cord again a couple of segments behind the original transection. This section excites an immediate transient rise in the arterial pressure, lasting about a minute, and succeeded by a gradual fall. The arterial pressure, then, in my experience, sinks to an equilibrium of pressure hardly lower than its mean prior to this second transection. There is none of that deep depression which ensued on the first trauma, tho the second trauma has been practically qua trauma a complete repetition of the former one. If the fall of general blood-pressure be regarded as part, and a severe part, of the 'spinal' shock which ensues on spinal transection in the cervical region, the absence of that fall on repeating practically the same trauma must signify that the second trauma is not followed by the shock that followed the first trauma. Moreover, reflex heightenings of blood-pressure such as were regularly obtainable just prior to the second transection, are obtainable immediately, i. e. four minutes after the second spinal transection. The first trauma causes temporary deep depression of the spinal tonus of the vascular system and temporary abolition of the vascular reflexes. The second trauma causes practically no depression, even transient, of the reestablished tonus of the vascular system nor of the pressor spinal vascular reflexes that have become similarly reestablished. It may perhaps be objected that the vascular tonus established subsequent to the first spinal transection is of peripheral mechanism and outside the spinal cord itself. That that is not its main factor is shown by the further deep depression of vascular tonus which occurs when the spinal cord in the thoracic region is itself not merely transected but destroyed."

"There remains the further question as to whether 'spinal' shock is a phenomenon of inhibition. A reflex during its depression by spinal shock does not present the features it shows when reduced by inhibition so much as features resembling those characteristic of it when fatigued. The scratch reflex under spinal shock shows irregularity of rhythm, slow, protracted, relatively feeble beats, and speedy onset of temporary inexcitability, features which characterize it when nearly tired out. So also with the flexion-reflex of the leg. In the period of depression by spinal shock the reflex is feeble even under strong excitation, is relatively short-lasting, and on cessation of the exciting stimulus shows little of the prolonged after-discharge that it is prone to show at other times: it also tires out then with abnormal rapidity. The scratch-reflex in spinal shock in pronounced degree fails to be elicitable by electrical stimulation at all, though still elicitable by rubbing. This indicates the greater efficacy of a stimulus more nearly like the adequate. The condition of the spinal reflex arcs in spinal shock appears to resemble a general spinal fatigue rather than an inhibition."

There can be no doubt that the central nervous system may, as the result of stimulation, not only be excited to increased activity but may at times respond by a diminution of its activity. It would be impossible to form any conception of the coordinated spread of impulses thru the central nervous system without acknowledging its effects. E. H. Weber, in 1845, after experimentally demonstrating the phenomenon of inhibition in the effect of the vagus on the heart, immediately extended the notion to the case of increased spinal activity witnessed after ablation of the brain. He suggested that removal of the brain removes a nervous mechanism which inhibits the reflex spinal machinery, but as a working hypothesis in physiology it only became accepted after the experiments of Setschenow in 1863. The latter found that stimulation of the midbrain and bulb, especially of the corpora quadrigemina, prolongs the reflex time. A frog, its cerebral hemispheres having been removed, withdraws its foot from a bath of acidulated water, if the above mentioned parts are at the same time excited, much later than it does otherwise. The postulation of an inhibitory center in the mesencephalon (and myelencephalon) was the first interpretation put upon Setschenow's observations. Then it was shown that similar inhibitions of spinal reactions could be obtained from foci in various other parts of the brain and of the cord itself. The inhibitions are obtained either mediately from sensorial surfaces or by immediate excitation of the foci themselves. Goltz introduced the view that a reflex center, engaged in a particular reflex function, suffers impairment in that activity when it receives incitation from any other afferent channel. Certain it is, a nerve cell thrown into activity may throw others not only into action but also out of action. Schiff and Herzen state that each spinal segment exerts an inhibitory influence on all segments lying further backward. Where, as in the higher mammals, the cord possesses an immediate path from the region of the cerebral cortex, it is considerably influenced in its reflex functions by the activity of that cortex. Reflexes purely spinal are facilitated by the removal of this cortex or by rupture of the descending path. The scratching reflex, which is easy to provoke from puppies and from the adult dog after high spinal transection, can, after ablation of the cortex cerebri, be abnormally, easily, and even uncontrollably elicited on the side of the body contralateral to the cerebral lesion. Instances might be multiplied indefinitely illustrating the activity of inhibitions in the nervous system. If, however, we turn our attention to other phenomena we are forced to the conclusion that excitations of the central nervous system are most readily elicited. In the familiar experiment of tapping the patellar tendon it can be shown that the kick under given environmental conditions soon reaches a general average extent. The slightest cutaneous or sensory stimulation of any kind, applied at this time, as a gentle stroke on the skin of the neck with a feather, is followed usually by a tremendous exaggeration of the kick. The excitation spreads thru the central nervous system and increases its irritability. Excitation being so familiar a result, further examples are not necessary. It need only be said that the continual excitation of the cord produces a constant minimal activity designated as spinal tone, but at all times excitations or facilitations of impulses are taking place. Either process may be retarded or accelerated. Particularly is this true of that collection of nerve cells or mechanisms situated in the medulla, known as centers.

The effect of incoming impulses over sensory nerves when the stimulation is weak is usually a rise of blood-pressure, which is due to increased rate of heart beat and presumably largely the result of inhibition of the vagus center. Experimentally strong stimulation brings about a fall of blood-pressure.

In surgical shock there is much evidence to show that this peculiar vital depression is usually accompanied by changes in blood-pressure. A moderate or slight traumatism causes a rise of blood-pressure—if the injury is severe or oft repeated, then there follows a fall of blood-pressure. Crile's experiments were taken to show that surgical shock is due to exhaustion of the vasomotor center, which renders it unable to maintain the tonus of the arterioles. But the cause of shock can not be due entirely to a fall in blood-pressure, for even when the section lies anterior to the second thoracic segment, and thus involves a fall of blood-pressure, the head shows no typical shock symptoms. Furthermore, whether the section is high or low the depression of functions of the caudal portions of the cord is equally severe. Section of the splanchnics, which produces a profound fall of blood-pressure, does not occasion shock. The loss of temperature is not sufficient to explain the phenomenon, for such a loss is easily avoided.

It has been affirmed repeatedly by investigators that continued sensory stimulation leads first to a stimulation of the vagus center and then to a paralysis. Paralysis of this center means, of course, a rapid rate of heart beat. A rapid heart beat in itself should lead to an increase in blood-pressure, so that other factors enter into the condition. The vaso-motor center is not unlikely affected like all other medullary centers. Excessive stimulation is said to lead to its paralysis. We have, then, in the vaso-motor center a mechanism whose failure to act would lead to the fall of blood-pressure which so often is the accompaniment of shock. Crile and the vast majority of investigators in this subject have as a matter of fact taken such a view of the case to the entire exclusion of purely nervous factors. Both enter into the production of the condition shock, but the nervous alteration is the primary factor. If it could be shown that the vaso-motor paralysis affects primarily the higher levels of the central nervous system, producing in these higher levels a loss of influence such as they normally exert on the lower centers, thus acting substantially like a section of the cord, which also does away with the activity of the higher centers, then we would have made a marked advance in an explanation of shock.

This method of reasoning, based as it is upon an exhaustion of the vaso-motor center, is rendered very uncertain and doubtful by the work of Porter and pupils in a series of papers published in 1907 in the *American Journal of Physiology.* These authors state (*Am. Journ. Physiol.* 1907, xxi, p. 504) that their experiments "demonstrate that the vaso-motor cells are not thus depressed or inhibited, and experiments published in the last number of this journal (1907, xx, pp. 444–49) show that excessive stimulation of afferent nerves does not materially lessen blood-pressure. The present hypothetical basis of shock is thus removed."

Recently tremendous light has been thrown upon the problem of surgical shock thru the publication of Yandell Henderson in the *American Journal of Physiology,* 1908, xxl, 1. This investigator was able to show that in dogs under artificial respiration the development of shock is not dependent upon the extent of the injuries and the intensity of the stimulations to afferent nerves, but upon the extent of pulmonary ventilation. It is well known that dogs are, ordinarily, with difficulty thrown into a condition of shock. Violent procedures are necessary. In Henderson's preliminary experiments, without violent operative insults and apparently under most careful treatment, dogs repeatedly passed into conditions resembling shock after having developed an introductory tachycardia.

The cause of these phenomena was traced to the method of artificial respiration used, leading to excessive ventilation of the lungs, so that finally they were able to induce or prevent shock at will. Their method proved also an excellent means of varying the heart rate from less than 40 to more than 200 beats per minute. The hypothesis was, therefore, formulated that acapnia is the cause of surgical shock. In operations the diminished carbon dioxid in the blood and tissues results from hyperpnea or from the exhalation of carbon dioxid from exposed viscera. It appears from the investigations of Henderson that the carbon dioxid content of the blood not only exercises a regulative influence upon the heart, but influences also vascular tonus, the peristalsis of the alimentary tract, the mental condition, and other functions of the body.

The rate of reduction of carbon dioxid in arterial blood exercises an important effect upon the subsequent phenomena. If the reduction takes place rapidly the tachycardia passes into a condition of the heart resembling tetanus, so that its efficiency as a pumping organ is abolished. Arterial pressure falls and death results. If the reduction in arterial carbon dioxid is less extreme and is maintained for an hour or so, the arterial pressure falls to a very low level. This fall is not due to tachycardia alone, for the heart rate is not always extreme, but is due to a loss of tonus in the peripheral veins and capillaries. Reflexes are greatly reduced. Stimulation of afferent nerves causes no rise in arterial pressure. The nervous depression, however, is said to precede the fall in blood-pressure. Coma is pronounced and the respiration shallow. The latter is the direct result of the reduced carbon dioxid tension in the respiratory center. In extensive investigations on surgical shock Crile found that 90 per cent of the subjects died of respiratory failure. The interesting review of literature by Henderson indicates that carbon dioxid as a hormone deserves a position of importance far greater than is usually attributed to it.

How long shock may persist is a question on which very different views have been held. Goltz believes that shock may persist for months or years. Sherrington, as the result of his work on spinal transection, believes that the cord is often more normal a short time after section than it is later on. The phenomena of shock seem to merge into the symptoms which result from the withdrawal of normal influences on the spinal nerve cells. This more permanent alteration he calls "isolation dystrophy." In cold-blooded animals these two periods hardly overlap, but in man clinical experience shows that shock is severe and "isolation dystrophy" arrives speedily.

THE BULLETIN
OF THE
UNIVERSITY OF NEBRASKA
COLLEGE OF MEDICINE

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THE BULLETIN is published quarterly in January, April, July, and October, by the University of Nebraska, at Lincoln, Nebraska

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Single numbers of THE BULLETIN may be had for 50c each. Complete volumes or subscriptions by the year $1.00.

All communications relating to THE BULLETIN should be addressed to
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EDITORIAL

Tendencies in Medical Education

"The rôle of a prophet is hazardous. If the would-be seer essays to depart from the commonplace, he is sure to be flayed if not guillotined by those who, as he thinks, thru prejudice or lack of foresight, do not have his views. He must leave his justification to the coming race, and among its numbers only the antiquarian will know he lived and thought.

"Why, then, should one prophesy? To the ruler of today, the financial leader, the lord of Wall street, such divertisement is time-wasting and unprofitable. Yet even he has made his pile by calculating three moves ahead in the game instead of only one, the measure of the ordinary mortal. In truth, every one essays the task of the prophet, but to down opposition joins in the clamor against the man who proclaims another gospel than his own.

"This is, then, the real value of prophecy,—to arouse criticism and perhaps, thru argument, often heated, to try out the gold in new ideas. The residue which has stood the test, small tho it often be, is the permanent possession of the race. By such slow accretion the wealth of knowledge is built up.

"What is the most remarkable, the most fundamental factor in the changes of the last decade or so in medical education? I write it down with some assurance as the elimination of individual profit and individual control. Proprietary medical education is ceasing to exist, even more surely than patent medicines, tho the crusade against the latter is led by men and journals that do mould public opinion, and the movement against the former is only an unknown undercurrent. Half a century back every medical school was a private corporation; even those few which in name were affiliated with great universities paid dividends to their stockholders—truly an absurd and anomalous condition in education. Americans are fond of fair play, so the public virtually said, Let there be as many schools as the doctors will that all may share alike in this profit, and schools multiplied. But to be profitable schooling must be inexpensive, and cheap schools turn out a poorly trained product, as contact with other nations promptly showed even the men themselves.

"Conditions have changed, and every year sees a reduction in the number of medical schools. There may yet be some which are declaring dividends, but they are few, and better still are generally condemned. Proper medical training is known to be expensive, and to give it schools are looking for endowment. They have given up proprietary control to become integral parts of great universities. They have found in many cases money for laboratories, apparatus, and research, and they have demonstrated their ability to employ wisely such trust funds. It is of peculiar interest to the Academy to note that this advance has been gained thru association with institutions primarily organized and endowed for academic instruction. No great medical school can continue to exist apart from a college, and the college atmosphere and ideals make proprietary schools and methods impossible. There can be no profit and hence no cash dividends; the college faculty is an oligarchy which comes very near being a true aristocracy. Individual views are seldom in complete control, and sectarianism does not thrive. The results of the change are worth examining in detail later, but now let us record only the evident general effect.

"The American medical school is fast assuming a true academic character."—*Dean Ward in Bulletin of the American Academy of Medicine.*

COLLEGE NOTES

Dr. C. H. Willis of Omaha has located at Wymore, Nebraska.

Dr. Irwin L. Thompson of West Point has located in Monroe, Nebraska.

Dr. Lawrence Pilsbury of Lincoln has gone to Europe for an extensive trip of four or five months.

Dr. A. C. Stokes has recovered from a recent attack of appendicitis which was relieved by operation.

Dr. A. P. Fitzsimmons of Tecumseh, Nebraska, is candidate for congressional nomination for the first Nebraska district.

Dr. George H. Bicknell of Omaha, Nebraska, was recently operated on for appendicitis at the University Hospital in Charlottesville, Virginia.

Dr. Lehnhoff recently spent some time at Rochester, Minnesota, studying the methods of diagnosis and the business organization of the Mayos.

Dr. G. A. Ireland of St. Edward has formed a partnership with Drs. Martyn and Evans at Columbus, Nebraska, and has removed to the latter place.

Ruth Eleanor Willard, who arrived at Grinnell, Iowa, on August 24 is a baby daughter gladdening the hearts of her parents, Professor and Mrs. Willard.

Dr. G. L. Strader, of Cheyenne, Wyoming, has been elected president of the Wyoming State Medical Society, and Dr. R. C. Knode, of Sundance, Wyoming, first vice-president.

Dr. R. A. Lyman attended the annual meeting of the American Pharmaceutical Association at Hot Springs, Arkansas, September 5 to 12, in the interest of the School of Pharmacy.

Dr. Barker had charge of a nature study class for boys given under the auspices of the city Y. M. C. A. of Omaha during July. August was spent at Milford prosecuting a research on the parasites of the soft-shelled turtle.

The absence of Dr. Alfred Schalek from his classroom during the first week of the present semester was due to his attendance upon the meeting of the American Dermatological Association. The meeting was held in Baltimore. This society is very select, the membership being limited to thirty-five. Dr. Schalek is the only member residing in this part of the country.

The teaching staff of the anatomical department has been increased by the addition of three demonstrators. They are Dr. Walter G. Hiltner of St. Elizabeth's Hospital; Dr. Geo. H. Walker of the Sunlight Sanitarium, and Dr. Henry P. Wekesser of 1105 O street, Lincoln. The assistants in this department for the coming year are Henry B. Boyden, Willis H. Taylor, and J. L. Wilson.

Dr. Henry B. Ward is a corresponding member of the American Academy of Medicine and upon him has been placed the task of interpreting the trend of affairs in the work of medical education. The latest pronouncement in this direction under the title *Tendencies in Medical Education* appears in the October number of the Bulletin of the American Academy of Medicine which, owing to the well-recognized fitness of Dr. Ward to speak on matters of medical education, we are taking the liberty of quoting in our editorial columns.

As the work advances it becomes evident that the new building of Clarkson Memorial Hospital will be a landmark in Omaha. While centrally located at Twenty-second and Howard streets, it is yet in a secluded spot. Crowning a hilltop, its five stories of buff-colored brick have become conspicuous from every direction. The building is now ready for the roof.

The addition to Immanuel Hospital is progressing rapidly, having reached the top of the third story. When completed this addition will more than double the capacity of the institution.

Dr. H. W. Orr has been appointed by the board of education of Lincoln to serve with Dr. J. F. Stevens and Superintendent Stephens of the city schools as a board of medical inspection of the schools for 1908 and 1909. The plan for inspection of the schools is to be modeled after that in other cities and is designed to provide proper care or suitable methods of teaching for those who are sick or physically defective in any way. It is the desire also to protect well children by promptly excluding from the schools those afflicted with any form of communicable disease

At the International Congress on Tuberculosis in Washington, Dean Henry B. Ward was one of the prominent members of the committee on prizes. This committee classified the exhibits displayed during the congress to decide in what departments they might compete for the prizes offered. On the committee of judges Dr. H. Winnett Orr served and was assigned to duty in the competition between exhibits of states and exhibits between countries and states, the United States excluded.

Dr. A. S. von Mansfelde, of Ashland, and Dr. C. O. Giese, of Holdrege, were also in attendance at the congress.

Dean Henry B. Ward attended the International Tuberculosis Congress in Washington as delegate from the University and also from the state of Nebraska. The University was honored in his appointment as member of the Committee on Awards, and also as Vice-President of Section VI. This section was presided over by Surgeon-General Walter Wyman and dealt with State and Municipal Control of Tuberculosis. Dr. Ward by invitation read a paper before Section V on *Educational Propaganda thru Local Lay Agencies, especially in Schools, Settlements, and Charity Organizations*. Dr. Ward also attended the International Fishery Congress which was in session at the same time and contributed to its proceedings a paper on the parasitic diseases of the salmon.

Dean Ward went to Carson City, Nevada, June 20, where he gave a lecture and also delivered the commencement address for the Carson City high school. This is the only four-year high school in the state, and its present high position is due to the effective and untiring energy of two Nebraska graduates, Superintendent W. J. Hunting and Principal A. Russell Moore.

After a walking and fishing trip thru the Sierras Dr. Ward spent some days in San Francisco, and a week later went to Seattle, Washington. In both places he made a careful study of the measures inaugurated by the municipalities and the United States Marine Hospital Service for the elimination of plague and the destruction of the rats. He had the opportunity of seeing specimens of the native rodents in which it has been conclusively demonstrated that bubonic plague also occurs on the Pacific Coast, and by which the disease has apparently been carried some distance beyond the cities into the country itself.

In the course of this trip Dr. Ward visited a dozen colleges and universities and discussed opportunities at the University of Nebraska with special reference to professional training in medicine.

Among recent changes in the College of Medicine none is more worthy of note as contributing towards an effective course of study than the appointment of Dr. Paul G. Woolley as associate professor of clinical pathology and director of the Omaha laboratories. Dr. Woolley will do all the pathological work in the Junior and Senior years and will inaugurate an effective course in post-mortem examinations. He comes to his post with the highest recommendations and with an educational experience which promises much of advantage to our students. Dr. Woolley began his college education at Ohio Wesleyan University and received the B.S. degree from the University of Chicago in 1896. He obtained his medical degree at Johns Hopkins University in 1900, and was resident in the Johns Hopkins Hospital for the following year, and a year later in the Montreal General Hospital. In 1902 he went to Manila as the government bacteriologist, becoming in 1904 director of the Serum Laboratory, and pathologist to St. Paul's Hospital in Manila. In 1906 he was called to Siam as director of the government Serum Laboratory, chief health inspector and medical advisor. Dr. Woolley has published extensively in American and foreign journals on bacteriology, pathology, and tropical diseases. Some of the most important publications from the government laboratories in Manila are results of his investigations. Dr. Woolley has already entered upon his work in Omaha and the college has made a special appropriation for refitting the laboratories properly in order to carry on the work he has planned. He attended the International Tuberculosis Congress in Washington, D. C., as official delegate of Siam.

The fall meeting of the Alumni Association of the College of Medicine was held in the building of the clinical department in Omaha, September 30. The following program was presented. Each paper elicited so much valuable discussion that the thirty alumni present felt it was one of the most valuable meetings the Association ever held.

PROGRAM

President's Address—Dr. B. W. Christie, Omaha.

Acute Infections of the External Ear—Dr. R. A. Knode, Omaha.

Report of a Case of Gall-Bladder Trouble—Dr. A. P. Overgaard, Fremont.

The Necessity of Stricter Quarantine Regulations in Contagious Diseases—Dr. J. M. Curtis, Calhoun.

The University of Nebraska School of Pharmacy, What It Means to the Medical Profession—Dr. R. A. Lyman, Lincoln.

Report of a Case of Surgical Kidney—Dr. C. W. M. Poynter, Lincoln.

Demonstrations of Gross Pathology—Dr. C. R. Kennedy, Omaha.

Intestinal Obstruction—Dr. W. H. Betz, Bellevue.

Psychotherapy—Dr. Alfred Jefferson, Omaha.

CHIENGMAI HOSPITAL AND DISPENSARY,
Chiengmai, Siam,
July 15, 1908.

Dear Doctor Ward:

I am most heartily ashamed of myself for not writing to you many times before, and my only excuse is, too busy to write, and really that is no excuse at all. There are so many duties crowding one upon the other that research work is simply crowded to the background. Worms! Yes, we have them out here. Only yesterday I was called to see a little girl twenty-one months old who was vomiting the *Ascaris,* and while there I pulled three out of her mouth. An awful sight. She died; they lived within a quarter of a mile of the dispensary, but waited and waited. My! how I pity the wormy youngsters of this country. And the *Taenia,* the *Ascaris,* and the *Oxyuris,* all of which are so common, are about all of the human parasites I have seen or had time to look for. Again pardon me.

I was so pleased to learn by your last letter to Dr. McKean that so large a percentage of the students were looking forward to foreign medical missions. I have not been long on the field, but every day is a satisfaction, and there is no question in my mind but that it is one of the grandest agencies for good the Master has ever used.

Our great work here is stone in the bladder, and it has been my fortune (or misfortune) to have operated on fifty-five cases already in my short experience. The largest stone I have removed weighed 4½ oz. Dr. McKean has removed one weighing 8 oz., while last January Dr. Hausen of Lakawn removed one that weighed 36 oz. from a man over seventy years of age. He lived over a week and then failed and died.

Well, I must close for this time. With best regards and wishes for yourself and yours. May the College grow and prosper in every way.

Yours most sincerely,
C. W. Mason.

The Pathology club of the College of Medicine met on October 10 at the Lincoln hotel. Dr. H. Winnett Orr presented a paper on *Tuberculosis in Children,* in which he reviewed sixty-seven of the more prominent papers delivered before the recent International Congress of Tuberculosis at Washington, D. C. Dr. Orr's paper has been accepted by the publication committee and appears in this number of the College Medical Bulletin.

The second meeting of the club was held at the Lincoln on October 24. Dr. C. W. M. Poynter superseded Dr. Orr as president for the ensuing year. Dr. R. G. Clapp was reelected treasurer. The paper of the evening was delivered by Dr. H. H. Waite, embodying the results of original work on infection with the bacillus *pyocyaneus.* The experiments in this paper referring to immunity against this germ had been demonstrated to the club during the preceding year. Dr. Waite's paper is being published in the *Journal of Infectious Diseases.*

Announcement has been made of a series of popular medical lectures to be given during the winter by men of the University faculty and others from out of the city. The first of the series will be given at a regular convocation hour in about two weeks. Others will follow at intervals of ten days to two weeks until the last of the series in April. These lectures, while primarily of a medical nature, will be of such a popular nature as to be readily understood by all students. Among the speakers are State Superintendent McBrien, Dr. McClanahan, Professors Ward, Waite, Howard, and Dr. Wellman of Chicago.

Thru the efforts of the medical faculty in Lincoln an auxiliary section called "The Conference on Popular Medical Education" has been added to the Nebraska Teachers' Association. The following program was given at the annual meeting on November 5.

1. *How May the Spread of Infectious Diseases be Prevented in Our Schools?*—Dr. H. H. Waite.
2. *What Teachers Can Do to Develop Healthy Children*—Dr. S. R. Towne.
3. *The Experimental Evidence Which Explains the Nature of the Action of Narcotics*—Dr. R. A. Lyman.
4. *A Plea for the Addition of Sexual Physiology to the Curriculum*—Dean Charles Fordyce.

The attendance was much larger than was anticipated, it being necessary to use three lecture rooms and repeat the program three times in order to accommodate those present. About six hundred teachers heard the program. At the close a permanent organization was effected with Dr. R. A. Lyman of the University as president, and Miss Caroline Stringer of the Omaha high school as secretary.

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THE BULLETIN

OF THE

UNIVERSITY OF NEBRASKA

COLLEGE OF MEDICINE

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LINCOLN, NEBRASKA

ENTERED AT THE POST-OFFICE IN LINCOLN, NEBRASKA, AS SECOND-CLASS MATTER UNDER ACT OF CONGRESS, JULY 16, 1894

CLINICAL FACILITIES

OF THE

University of Nebraska College of Medicine

THE COLLEGE DISPENSARY
THE NEBRASKA METHODIST HOSPITAL
THE IMMANUEL HOSPITAL
THE DOUGLAS COUNTY HOSPITAL
THE CLARKSON MEMORIAL HOSPITAL
THE WISE MEMORIAL HOSPITAL
THE CHILD-SAVING INSTITUTE
THE JENNIE EDMUNDSON HOSPITAL
THE TINLEY RESCUE HOME
THE SWEDISH HOSPITAL

THE BULLETIN

OF THE

UNIVERSITY OF NEBRASKA

COLLEGE OF MEDICINE

VOL. IV APRIL 1909 No. 2

The Genesis and Pathologic Anatomy of Diverticula of the Sigmoid

BY PAUL G. WOOLLEY, OMAHA, NEBRASKA

You will remember that not many years have passed since the medical profession began to realize that certain symptoms, generally referred to as "inflammation of the bowel," were the result of an inflammation of the vermiform appendix.

In more recent times,—as a matter of fact in very recent times—attention has been called to cases presenting symptoms in every way similar to those of appendicitis except that the pain, rigidity, tumor, etc., are on the left side instead of being on the right. Some of these cases are more like chronic than acute left-sided appendicitis.

It has been found that in such cases the symptoms originate, not in a displaced appendix, but in pouches of varying size, whose lumina are in direct communication with the lumen of the intestine, usually the large intestine.

At the expense of brevity, perhaps, but for the sake of lucidity, let me give you the common classification of intestinal diverticula, for the subject is not a common one tho it is coming to be, and you have perhaps forgotten it.

Intestinal diverticula are congenital or acquired. Meckel's diverticulum is an example of the former. Futhermore they may be true or false. The true diverticula are merely bulgings

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Read before the Path. Club of the College of Medicine Univ. of Nebr. April 30, 1909.

of the intestinal walls so the walls of the bulging pouches are composed of all the layers of the intestine,—namely, mucosa, submucosa, muscularis, and serosa. False diverticula on the other hand are for the purposes of description hernial protrusions of the mucous membrane of the gut thru the muscularis of the intestine and their walls are therefore composed of mucosa, submucosa, and serosa. It is to these false diverticula that I wish to call your further attention.

To begin with they are more common in the large intestine than in the small, and are much more common in the sigmoid than in any other part of the large bowel. Grazer found them in ten of twenty-eight cases. Sudzuki found them fifteen times in forty cases. In Omaha Dr. Dunn and I have encountered them four times in sixty cases that have come to autopsy. One of these was of the appendix. They are more frequently seen near or at the mesenteric border of the bowel. They may project into the appendices epiploicae, or into the mesentery.

The causes given to account for their production are various, but they are certainly more common in elderly persons especially in those who have suffered from constipation. This fact formed the basis for the conception that they were the result of atony of the muscle of the bowel with coincident increase of intraintestinal pressure. Klebs believed that they were more frequent in fat persons and that they resulted from traction on the mesentery. Hansemann thot them more frequent in thin persons and that they were due to pulsion. Klebs pointed out that they bore a relation to the blood vessels of the intestinal walls.

Now if the bulgings were due to pulsion they would tend to be located at the points of least resistance, and with the idea of proving where the normal points of least resistance were Herschel, Hanau, and Good made experiments by filling the guts of cadavers with water and observing where rupture took place. They found that rupture occurred regularly into the mesentery. Chlumsky later made experiments of a similar character but used living intestines, and showed that the point of greatest weakness was not at the mesenteric border, but opposite it. The conclusion is obviously then that diverticula are not dependent upon weakness of the intestinal walls alone. Besides as Beer suggests, if it were merely anatomic weakness that accounted for these protrusions, all old persons should have them. Beer believes that the diverticula result from a combination of age, muscular weakness, and constipation. There is still another factor that I have mentioned, namely, that of the blood vessels. Klebs first called attention to this and Hansemann accepted it. All later writers have considered it an important factor, for it is held that the real *loci minoris resistentiae* are at the points where the vessels penetrate the intestinal walls, and that the combination of this weakness plus internal pressure, due to accumulation of gases or fecal matter or both, is the basis for the development of the herniae of the mucous membrane. Moreover a considerable number of the reported cases have showed that the diverticula bore a more or less definite relation to the sheaths of the vessels.

It has been suggested that passive congestion such as occurs in heart and pulmonary diseases is active in predisposing to the formation of diverticula by causing dilation of the vascular pores. A similar predisposing factor would be an abnormal deposition of fat along the sheaths of the veins, but this can not be demonstrated in many cases. It seems to me that congestion can best explain this matter; not the usual passive congestion however, for that, while it might lead to widening of the pores, would also keep them filled, and therefore exert a counter-pressure to balance the internal intestinal pressure. I would suggest (perhaps it has already been suggested; the literature at my command has not been complete) that the important factor so far as the relation to the blood vessels is concerned, is alternate high and low blood pressure:—a series of pressure phenomena that might well occur in any case of constipation, and which if accompanied by muscular atony or atrophy due to old age or previous inflammatory changes would make the conditions for the formation of diverticula reasonably good. Add to this constipation with its coincident retention phenomena and it seems to me the conditions would be perfect.

Now if these aforementioned factors are the only ones we would expect that the diverticula would arise between the rugae of the intestine and give rise to appearances illustrated in Mayo's article on this subject. If, to illustrate this mechanically, we take a rubber glove with the fingers turned in and inflate the glove with air, we find, instead of the finger of the glove being gradually evaginated with the evagination commencing at the tip of the fingers, that the bulging is between the fingers and the evagination commences at the base of the fingers. In my case on the contrary the diverticulum formation commences at the tips of the mucous folds and gradually extends outward, until the mucous membrane and the submucosa protrude thru the muscularis forming a hernia. In this process there seems to be a relation to the blood vessels.

Before trying to explain this process let me give you a brief history of the case from which my material came.

The man was of middle age, of good habits, strong and well except for some indefinite digestive trouble of some duration, which latterly was associated with an atonic condition of the lower bowel. The result was that for the space of some time, months perhaps, his rectum was never emptied except possibly after an enema. At this time enemata while they caused an unusual amount of discomfort, relieved him greatly and lead to a decrease of the urinary indican. Indicanuria I might say was constant and of a marked degree. About six months before his death the patient was taken with sudden and severe abdominal pains and was rushed to a hospital where an appendicectomy was performed. The appendix was not severely affected, was congested but nothing more. The peritoneal cavity contained a small amount of serum but there was no exudate on the peritoneum.

Later the patient was put upon a rather strict dietary, he having shown some symptoms of intestinal autointoxication, in evidence of which was the continued presence of large amounts of indican in the urine. He was forbidden to take indiscreet chances with his diet. These last orders he neglected, and from a condition of gradual improvement he was confined to bed. After this time it was noticed that there was more or less constant pain in the left side in the sigmoid region, with the gradual appearance of a tumor mass of indefinite proportions. At this time enemas simply served to accentuate the pain in the large bowel, the last one causing collapse. After a consultation he was again admitted to the hospital where he was again operated upon. An incision in the appendix region allowed the escape of a quantity of pus which seemed to come from the pelvis.

The pelvis was drained. Some days later the patient died, the mass in the left side persisting.

The autopsy report was as follows:

Operation about ten hours after death. Skin very pale. Slight rigor mortis. Peripheral lymph glands not enlarged. Two operative wounds on abdomen; one in mid-line about ten cm. long; one over appendix about seven and one-half cm. long. The latter drained. Subcutaneous fat well developed.

Upon opening the peritoneal cavity it was seen that the omentum was adherent over the whole anterior surface of the peritoneum, and less extensively to the intestinal coils. It was rolled into a mass in the left hypochondrium.

The intestinal coils were more or less generally adherent by old fibrous adhesions, and were also adherent to the peritoneum in the right flank. The upper coils of the ileum were closely adherent, as were also the lower ones, which were adherent to the sigmoid by old and recent adhesions.

The cecum was bound down by adhesions, most of them recent, the result of an operation done some days before to drain the cecal and pelvic regions. There was no pus in the pelvis or about the cecum. The appendix had been removed.

The intestines were carefully dissected out and no other process than an adhesive fibrosis was encountered until the lower loops of the small intestines were dissected away from the sigmoid, just at the brim of the pelvis. At this point an abscess cavity that was under the sigmoid and walled off by the small intestine, was opened.

As the large intestine was removed pus was again encountered to the left and beneath the descending colon and sigmoid. This suppurative process could be traced to the abscess cavity mentioned above and to a larger one to the left of it, in the post-intestinal tissues and just at the brim of the pelvis. The process had apparently also extended down (judging from the adhesions) but this extension had been limited by adhesions in the pelvis. Extending up along and behind the descending colon the line of extension of suppuration could be followed to the spleen, which was half enclosed in an abscess cavity.

An incision thru the diaphragm from below and exploration of the left pleural cavity occasioned a gush of foul-smelling, greenish-yellow, thin pus to the amount of about 500 c. c.

The thorax was then opened and examined. The left lung was partially compressed by an empyema that extended from the diaphragm to near the apex. The pleura was covered by a greenish yellow fibrino-purulent exudate. The left apex was the seat of a large healed scar, and scattered about on the pleura and in the pulmonary tissue were fibroid and calcareous obsolescent tubercles.

The right lung was also the seat of a healed tuberculous process, the pleura being thickly studded with obsolescent tubercles especially at the junction, posteriorly, of the inter-lobar clefts.

The heart was pale but otherwise normal.

The liver was small, pale and exceedingly soft.

The kidneys were very large and pale. The capsules stripped leaving an untorn surface. Section of the organ showed the cortex enlarged, pale and granular in appearance, with little line of demarcation between it and the medulla.

The adrenals were normal.

The pancreas was normal.

The spleen was ofnormal size, but soft and the seat of an acute suppurative perisplenitis.

When the intestines were opened it was seen that the small intestines were atrophic, the walls thinned, the rugae not prominent and the mucosa thinned. From the cecum down, the submucosa and the muscularis became gradually thickened until in the vicinity of the brim of the pelvis, the wall was from two to five millimeters thick, and the perisigmoidal and rectal tissues were generally firm and infiltrated.

The sigmoid and rectum showed accentuated diverticular pouches, all of which had thinned distal ends—that is, at their mouths the submucosa and muscularis were very thick and edematous. At the bottom of these pouches the thickness measured not more than one-half to one millimeter. Extending from the distal end of one of these pouches was a sinus, surrounded by thickened fibroid walls, that communicated with the larger post-colonic abscess cavity mentioned above. From this pouch or diverticulum the suppurative process had apparently originated. The tops of the folds of the descending colon and sigmoid showed numbers of small areas having somewhat the appearance of shallow ulcers and some scars. These areas measured not more than one by two millimeters.

They had slightly thickened, raised, and rounded margins, and gray bases.

ANATOMIC DIAGNOSIS

Anemia; catarrhal sigmoiditis and proctitis; diverticulum formation; chronic perforative diverticulitis; suppurative perisigmoiditis; colitis, and perisplenitis; emypema; acute parenchymatous degeneration of the kidney; fatty degeneration of the liver; obsolescent, calcareous pulmonary tuberculosis; left apical scar; general organized peritoneal adhesions; operative wounds.

What happened in this case as I conceive it was this. The patient had suffered from atony of the bowel, coincident constipation, and chronic enteritis. This latter accounts for the hypertrophy of the submucosa in the lower bowel. At the same time the changes in blood pressure, resulting from straining to empty the bowels and from the accumulation of gases in the intestinal brought about the anatomic changes that favored diverticulum formation, and this was assisted by continued fecal stasis and increased intraintestinal pressure—the whole process forming a vicious circle. It is possible, and I put this forth merely as a suggestion, that the first dipping down of the mucosa at the tops of the folds may have been due to a fibrosis resulting from the action of toxins upon the perivascular tissues in the absorption paths, and that the contraction of this new-formed fibrous tissue led to the peculiar early deformity at the apices of the intestinal folds. However that may be, diverticula were formed and in one of them—in one of these hernial pouches—fecal accumulation occurred and this resulted in ulceration of the wall of the pouch, and in perforation into the perisigmoidal tissues. The infective agent must have been one of mild virulence and was very possibly the colon bacillus, for the suppurative process was a slow one and caused no marked reaction beyond a slight leucocytosis, except on two or three occasions, after enemata, and at the times of the two operations. It seems apparent that after the perforation the pus extended down into the pelvis which it finally filled so completely that it could be drained from an appendix incision. In this connection it is interesting to note that during this stage of downward extension the patient was on his feet, and that after the drainage of the pelvis when he was no longer able to be about, but was confined to his bed, the suppuration extended up along the descending colon.

So much for this case. You can see what serious difficulties can result. Other results in chronic cases are stenosis of the sigmoid or other parts of the intestine, perforation into the general peritoneal cavity, perforation of the bladder, etc. In acute cases as I have said all the complications that accompany acute appendicitis may occur. The condition is one that merits careful study.

Acute Perforations of the Hollow Viscera

BY BYRON B. DAVIS, OMAHA, NEBRASKA

Probably no calamity which may befall calls for more promptness in treatment than the several perforative lesions which frequently involve the gastro-intestinal tract. Every man engaged in the practice of medicine should have clearly in mind the differential points in the diagnosis of these conditions as well as clear cut notions about treatment. Prompt diagnosis and prompt treatment are necessary if the life is to be saved.

Perforation of gastric and duodenal ulcers, of the gall-bladder, of the appendix and typhoid perforations are the type of all and will be the ones to be considered at this time. Acute perforations of round ulcers of the stomach are practically always accompanied by serious and well-marked symptoms. First there is usually sudden sharp intense pain in the epigastric region, so sudden and so intense that it is not a rare occurrence for the patient to fall to the floor in a faint. This very intense pain is usually short in duration, but well-marked shock is present for a variable length of time, ranging from an hour to several hours. The ordinary manifestations of shock are found, a cold clammy skin, paleness of the face and lips, restlessness, a thready pulse and a subnormal temperature.

Within a few hours tenderness over the abdomen becomes general, perhaps slightly greater over the epigastrium, and abdominal rigidity is marked and board-like. When the rigidity is first manifest the abdomen is usually flat, but it soon becomes distended and tympanitic and vomiting is likely to occur, the typical vomitus of peritonitis. The pulse has now become fuller and more rapid and as the peritonitis progresses it becomes still more rapid and more feeble.

The symptoms given by Mayo Robson are as follows:—

"A sudden sharp abdominal pain............ Almost immediately the expression of the face changes to one of anxiety and great distress; the extremities become cold and clammy and the face blanched; the respirations are usually shallow and quick and the pulse rapid and most imperceptible at the wrist; vomiting may occur. As a rule the patient rallies and the initial symptoms of shock pass off to a certain extent. There is then a great complaint of thirst which can not be satisfied and the urine is scanty and highly colored."

The recti are rigid, the whole abdomen is board-like, at first retracted, later distended with gas. Liver dullness usually absent. In about 90% of the cases a history of previous stomach trouble can be elicited.

Treatment—Total abstinence from water, as this will only increase the peritoneal soiling. Cardiac stimulants used hypodermatically and if the shock is very severe all the usual methods to combat shock. Even on strong suspicion laparotomy should be performed since it has been shown that the earlier the operation after this calamity the better the results. Mayo Robson and Moynihan have compiled a table of the mortality following operation on 133 cases.

Operated within 12 hours..........	Mortality	28.5	percent.
Operated in from 12 to 24 hours ...	Mortality	63.6	percent.
Operated in from 24 to 36 hours....	Mortality	87.5	percent.
Operated in from 36 to 48 hours....	Mortality	100.0	percent.
Operated after 48 hours	Mortality	51.5	percent.

It is seen in this table that the mortality increases rapidly up to forty-eight hours when it becomes 100 percent. Cases done later than this show less mortality, due no doubt, to the well-known fact that some of them have only a localized infection, becoming walled off and these occasional, favorable cases are the ones most likely to be in a condition after two days to warrant an operation.

Sinclair Kirk, quoted by Robson, reports the most ideal results. He gives eleven cases all of which recovered. Eight of them were operated within five hours, one in seven, one in ten and one in twenty hours after perforation. It is now generally conceded by those with the best experience that the operation should be done with the greatest promptness possible compatible with good and thoro work regardless of the shock present at the time. Death is not as likely from shock as from peritonitis if operation waits on shock.

As regards technic simple closure of the perforation by two or three superimposed purse-string sutures of linen thread, is the best. The subject of drainage is important. If there is almost no peritoneal soiling it is sometimes advisable not to drain.

As a rule pelvic drainage thru a stab-wound above the pubes, by means of a rubber or glass tube, and with the patient in the exaggerated Fowler position is most likely to meet with good results. This should also be followed by the use of normal salt solution per rectum after the Murphy method, and ice over the abdomen, nutritive enemeta and entire gastric abstinence for from three to seven days.

The question whether, after closure of a gastric perforation, it is advisable to perform gastro-enterostomy has been much in the foreground during the past few years. Often ulcers are multiple and secondary perforations may occur, as they have done in many instances. Robson, in Keen's Surgery gives the arguments in favor of gastro-enterostomy under such circumstances as follows:—

"1. That other ulcers will be cured by the operation.

2. That if a second ulcer is on the point of perforation such perforation will probably be prevented, as tension of the stomach walls will be avoided.

3. That after gastro-enterostomy more secure healing of the sutured ulcer is likely to occur, and there will be less likelihood of the stitches giving way.

4. It diminishes the risks of hematemesis occurring. after operation.

5. It enables saline aperients to be given shortly after operation and so secures more efficient drainage of the peritoneal cavity.

6. It permits earlier feeding than would otherwise be the case.

7. If the ulcer is at the pylorus it prevents the danger of stenosis."

In perforating ulcer of the duodenum we have the same acuteness of the onset, but the sharp primary pain is a little more to the right. If a history of previous gastric symptoms is obtainable, the pain is found to have come on two and one-half hours to four hours after eating instead of one to two hours as in gastric ulcer. The course of the case, the need for prompt operation and in general the technic of the operation and the indications for or against gastro-enterostomy are essentially the same as have been outlined for perforating ulcers of the stomach.

Perforations of the gall-bladder are fortunately rare. The sudden pouring out of the contents of a distended gall-bladder into the unprepared peritoneal cavity brings about intense shock which may prove immediately fatal. Usually the inflammatory trouble has already produced pericystic adhesions so that the general peritoneum is protected against acute perforations. When they occur the operation should usually include removal of the gall-bladder.

Acute perforations of the appendix vermiformis are exceedingly frequent, more so, I am convinced, than is generally supposed. Here, too, the general peritoneal cavity is usually protected by adhesions before the perforation occurs, resulting in a localized abscess. The omentum here serves a most useful purpose surrounding and becoming adherent to the inflamed appendix.

Unfortunately the infection of the external peritoneal covering of the appendix does not precede perforation, at least not soon enough to induce life-saving adhesions. In these cases there is immediate shock of greater or less degree and a rapidly following general peritonitis. Operation before time for the onset of peritonitis gives the best results. If not soon enough for this the more recent the peritonitis the better. In general it may be said that the mortality increases rapidly with the development and progress of the peritonitis.

Every case of typhoid fever is liable at any moment, especially during the latter part of the second and during the third week, to become a very urgent emergency surgical case by the occurrence of a perforation. It is doubtful if we have even yet fully realized the importance of perforations as a mortality factor in typhoid fever, or the number of lives that might be saved by prompt diagnosis of this calamity and timely operation. Osler several years ago stated it as his opinion that one-third of all the deaths in typhoid fever are due to perforations. When we consider that upwards of 50,000 die annually of typhoid fever in the United States and that over 16,000 of these deaths may reasonably be attributed to perforations, it gives the discussion of this subject a dignity which merits the best thought and best effort of all engaged in the practice of medicine and surgery.

I am convinced that every one treating a case of typhoid should have constantly before him the liability of the occurrence of perforation and that he should be on the alert to recognize it when it occurs and to act promptly should the emergency arise.

The nurse should be instructed that the occurrence of sudden and unusual pain in the abdomen, especially in the right lower quadrant, is a danger-signal and calls for immediate notification of the attending physician. She should also be instructed to note the pulse and temperature of the patient at half-hourly intervals after the occurrence of the acute pain. She should also be on the alert for other manifestations of shock as pinched features, cold extremities, clammy skin, the characteristic restlessness, etc., and the physician should be informed of the results of these observations as soon as possible that he may have all the aids to diagnosis at hand. Often subnormal temperature and other shock symptoms are very transitory and by the time the physician can reach the house they are gone. By this time it is usual for the abdominal muscles, especially over the site of perforations to become somewhat more rigid than normal, the rigidity increasing in intensity with the advent of peritonitis.

It may be stated that the severer the type of the fever and the worse the physical and mental condition of the patient at the time of the perforation, the more difficult will the diagnosis be and the more likely will the occurrence be overlooked. Definite symptoms such as have been sketched, even tho the diagnosis appears to be in some doubt, call for immediate abdominal exploration. In cases of doubt, if operation is delayed until positive diagnosis of developing peritonitis is made, the mortality is more than doubled. Thus far I have found perforation in every case operated and must confess to having lost some cases because of fear of opening an abdomen needlessly.

The mortality following perforations of typhoid ulcers without operation is said to be from 95 percent to 99 percent by different observers. The mortality of cases operated promptly after the occurrence of perforations, has been given by several at less than 50 percent. It must be acknowledged that at the period these operations are usually done the mortality is very high, many reporting 75 to even 100 percent. This mortality is not necessary if operation is done before peritonitis begins to develop, and I expect to live to see the time when prompt operation is the rule and the mortality not more than ten to twenty percent.

In all the operations for perforations the time element of the operation itself is of the utmost importance. "Quick in and quick out" should be the maxim. Labored and prolonged technic will kill more than it will save. The aim should be to stop the leak by simple suture and establish peritoneal drainage by a large tube thru a stab-wound over the pubes with its end resting in Douglas's cul-de-sac in general. In rare instances it may be found that the leakage has been so slight and the soiling so localized that drainage may be dispensed with. It is also my opinion that we should be guided always by the time-worn maxim "When in doubt drain."

The one or two important points it is desired to accentuate are,

1. In every acute abdominal pain, think of the possibility of perforation of some part of the alimentary canal, and do not dismiss the case as trifling till perforation has been definitely excluded.

2. In every case of perforation there is an absolute indication for immediate operation.

3. If the symptoms point rather definitely to perforation, but the diagnosis is in some doubt, exploration is safer than delay.

4. Shock is no contra-indication to operation.

5. The operation should be as expeditious as possible, doing only what is necessary and leaving artistic ideals to less urgent cases.

The Serum Treatment of Erysipelas

BY W. O. BRIDGES, OMAHA, NEBRASKA

In looking over the late text books on the practice of medicine one is impressed with the scant reference made to the serum therapy of erysipelas, even if mentioned at all. In Osler, Thompson and French no mention is made. Anders quotes a few authors as having reported successful cases, and adds "The serum treatment is to be encouraged." Tyson refers to five cases of successful treatment reported by Russian physicians in writing of the use of diphtheria antitoxin in other diseases than diphtheria, and presumably assumes that the antitoxin was used by them in erysipelas. Wood and Fitz state that streptococcus antitoxic serum has been used in the treatment of erysipelas by Mamorek, Gnomakowsky and a few others with alleged good results. Edwards writes, "Chantemesse reduced the death rate of his cases two and one-fourth percent by serum treatment, a figure often reached by more simple treatment measures, say Rogers and Botogeni."

Referring however to other than text book literature, sufficient evidence is found to warrant a strong hope that the use of anti-streptococcus serum in the treatment of erysipelas is a step in advance and we wish to call attention to specific data and personal impressions to warrant this hope.

McMillan[1] in 1901 reported one of the first cases so treated. The case was severe, involving the face and scalp with persistent vomiting interfering with food and medicine. Ten cubic centimeters were injected and repeated on the following two days. The evening of the second day the local lesion was improved and the vomiting less. After the third dose the vomiting ceased, the redness and swelling subsided, the temperature dropped to 99, pulse 102 and rapid recovery followed.

Gill[2] in 1902 reported the recovery of a severe case under the same treatment.

Jarcho[3] in 1903 was a strong advocate of the use of the serum.

Ayer[4] in 1904 reported a series of fifteen cases treated by injections of serum. His conclusions after some details of explanation were, 1st—"The administration of anti-streptococcus serum shortens considerably the course of an uncomplicated attack of erysipelas." 2d,—"That it tends to inhibit extension of the disease." 3d,—"That it has a strikingly beneficial effect upon the general condition of the patient, reducing the temperature, pain and discomfort." 4th,—"That it rapidly reduces the pathological leucocytosis." 5th,—"That it prevents or suppresses febrile albuminuria." 6th,—"That its use is attended without danger even in large doses." 7th,—"That the only disagreeable symptom referable to the serum, observed by the writer, is a transient eruption which occasionally occurs at the site of the injection." 8th,—"That the efficacy of the serum treatment is in direct ratio to the length of time which has elapsed between the onset of the disease and the first injection of the serum."

Ayer[5] reported thirty-three additional cases and reasserts his belief in the efficacy of the serum treatment. He comes to the conclusion, however, that it is useless to administer the serum after the third day of the disease. In his last series he states the average duration was shortened 2.6 days.

Gregoni[6] believes that the serum treatment of erysipelas is the rational one. Failure from its use he ascribes to using the serum too late, or in insufficient doses. He claims to have obtained remarkable results in a case of marked severity complicated by meningitic symptoms.

The value of the serum therapy has also been most favorably commented upon by A. Goss[7], Hobert[8] and Leudeking[9]. On the other hand a few writers take issue with the foregoing Gottheil[10] reports his experience with it as entirely unfavorable, and states that while the treatment seemed to do no harm in a number of cases in which he tried it, yet it did no good. Vidal[11] in a paper before the Medical Society of Paris contended that there was no proof of its having any effect upon the disease or its complications. Meyer, who favors the treatment, reports that he did not obtain any result from its use.

At the time Ayer's paper appeared, I had recently lost two cases of erysipelas of great severity; one thru death in which the disease extended with intensifying symptoms, finally involving the throat and larynx, in spite of most active treatment and attention. The other passed to another physician because of my incapacity, and afterwards died. Both of these cases give no hint at their commencement of a serious type; the first being apparently a healthy young woman, and the other a laborer of good physique, but rather intemperate. Since that time, I have used the serum injection treatment in every primary case which has come under my observation, now numbering ten. Some of these were quite severe—all recovered. My favorable impressions of the treatment were based on the very marked effects; upon the fever, pulse, comfort of the patient, extension of the local lesion and the earlier termination the of disease. The fever and pulse in several of the cases were thought to be influenced as if an antipyretic had been administered, lowering remarkably, six to eight hours after an injection, followed a few hours later by an exacerbation, and again remitting after a subsequent injection. The extension of the local inflammation seemed not always to be influenced. In some there was a decided decrease in the intensity of the extension. In others, there seemed a mere reddening of the extension, without infiltration, but in all the most noticeable result was found in a defervescence of the parts originally involved, within twenty hours after injection, while yet extension was going on. For instance, it was frequently noted, that starting from the nose, and extending to either cheek and eyelid, by the time the latter had reached the maximum of swelling and redness, the nose resumed an almost normal appearance, barring a little redness. In case the lesion started on the cheek, and involved the eyelid on one side, to the extent of complete closure, when in extension, it reached the opposite side—it was not so sufficiently intense to close the eye and the lids first affected were sufficiently relieved to permit of opening. In no case did the picture present such a complete involvement of the entire face, as to exhibit that complete loss of contour with inability to open the lids, even a crack, and total loss of facial expression, which we have seen so many times. One might assume that these cases were all mild and would have recovered under any treatment. The latter part of the assumption can not be controverted, but the former will not hold, if one is to judge from high fever, delirium, active, severe and rapid extension. One of these cases was a man in the sixties, whose son had died the previous year of erysipelas, and who with the entire family was much depressed and apprehensive. Chill, fever above 103, great restlessness, were the ushering in symptoms, with involvement of the nose and one cheek, at my first visit. Extension of the lesion, delirium, vomiting occurred—but in six days the patient was completely convalescent.

Another case might be said to have been mild, a woman about fifty had a chilliness, with slight redness of the nose and a temperature of 99.5, at my first visit. Diagnosis was reserved twelve hours, when fever was 102.5 and redness with infiltration had decidedly extended. Only one injection was given, followed by rapid improvement and the patient convalescent in three days.

I have just had under observation, a severe case in a woman whose husband recently died of the disease. The serum was given in the first twenty-four hours, when the lesion involved the nose and right cheek only. Extension occurred in spite of the injection and at present writing, (the third day) while the whole face is involved, the nose is pale by comparison, is not tender and the swelling has markedly decreased. Contrary to Ayer's statement, however, albuminuria developed, with scanty urine and nausea, which persisted two days when it rapidly subsided and convalescence became established on the sixth day.

In a disease which varies so much in its clinical history, it is impossible to deduce conclusions as a result of any special line of treatment, and one must be largely guided by personal impressions in the local and general effects of a particular course carried out.

Statistics count for little, and only after extended use of a given therapy by much observation over a considerable length of time, can we assume definite results. I do not wish to claim that antistreptococcus serum in the treatment of erysipelas, is specific, but I do want to state that my impressions formed from its use in a few cases, have led me to feel that I was not giving my patient the benefit of all I could do, did I refrain from giving the serum.

Fehleisen's discovery of the streptococcus erysipelatas as the etiological factor in erysipelas, led to the preparation of the serum, which has been designated "Antistreptococcus serum." This serum is supposed to be specific for any streptococcus infection, but the variations in the strains of streptococci, which are found in these infections, brought up the question whether the particular serum was acquired from the particular strain, which was the cause of the disease under treatment. This led some producers to secure a serum, resulting from the use of a combination of the different strains which it was hoped would be antagonistic to any special variety in a given case. On this account I have selected the preparation, put up by Stearns, which is called streptolytic serum. Whether there is anything in this theory, I do not know. It is a reminder of the old shot gun prescription of many drugs, which was argued must contain at least one to hit the mark.

If the serum is to be used at all, it should be given early. From Ayer's conclusions, it is of no value after the third day, and in this regard is like other serum specifics. It is unnecessary to wait until the severity of the case is determined, as valuable time is lost and the remedy is harmless. I use it at the time the diagnosis is made, giving twenty cubic centimeters at the first injection. This is repeated in twenty-four hours, if any intensified extension of the lesion occurs. If there is marked improvement in the symptoms, and only slight increase in the lesion, ten cubic centimeters are administered. This rule also applies to the third day.

I have never administered more than sixty cubic centimeters all told, in one case, and less than this was sufficient in most of my cases.

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Tuberculosis of the Skin

BY ALFRED SCHALEK, OMAHA, NEBRASKA

To this class belong all skin diseases which are positively known to be due to the invasion of the tubercle bacillus into the skin or mucous membranes. They are by no means rare and are found most often amongst the poorer class of people who have little or no means to protect themselves prophylactically. General tuberculosis may exist at the same time but this is the exception. It would be interesting to know why the lungs and other organs are so much more frequently involved than the skin which is considerably more exposed to the infection. It is probable that the firm and not vascularized epidermis with its lower temperature prevents this accident.

Tuberculosis may invade the skin in two ways: I. By external inoculation, as is frequently seen in families in which some of the members suffer from consumption and others from cutaneous lesions only. Furthermore in people who come into contact with tuberculous material, like physicians, butchers, cattlemen and others. Similarly a phthisic patient may infect his own skin with his own sputum or other tuberculous secretions. II. The infection of the skin may come from internal sources and may be due to spreading of the virus from bones or glands either by contiguity, or by metastasis thru the blood and lymphatic circulation. It is difficult to ascertain which of these etiological moments is responsible in an individual case since the cutaneous appearance does not differ essentially with either mode of infection but according to the different biological conditions of the skin and the individual peculiarities.

Certain names are still in general use for tuberculous skin affection with definite clinical appearances tho they date from prebacteriological times. Such as have been positively demonstrated to be due to the tubercle bacillus are lupus, tuberculosis verrucosa, the scrofuloderma and the acute miliary tuberculosis of the skin. Many other dermatoses are now considered paratuberculous, that is, caused by the toxins, but such connection has not been definitely demonstrated; many of the patients affected with them, suffer from lymph-adenitis, periostitis, caries and necrosis, a complication of symptoms usually defined by the rather ambiguous name of scrofulosis. Among these skin diseases, collectively called tuberculides, are erythema induratum, acne cachecticorum, hydroadenitis suppurativa, lupus erythematosus and others. They will not be taken up in this discussion outside of merely mentioning them, because they are rare and of interest to the specialist only. The general practitioner, tho, should be thoroly posted on the acknowledged types of cutaneous tuberculosis and should recognize them the same as he would tuberculosis of the lungs and other internal organs.

In the description of the principal varieties I will consider briefly the characteristic diagnostic points which facilitate an early recognition of their nature. Lupus vulgaris and scrofuloderma begin usually in childhood, while the tuberculous warts and the miliary tuberculosis are seen more often in older ages. Lupus vulgaris is found much more frequently abroad than in this country, still it is not as rare as some occasional statistics would make us believe. Certainly many such cases are labeled with a wrong name and escape recognition. The common location of lupus are the exposed parts of the body, especially the face. Its typical lesion is a small nodule of the size of a pinhead and rarely larger than a split pea. It is at first located within the skin but gradually presses upward, producing a small elevation over the surface which at first does not present any alteration but soon appears glossy and slightly scaly. The nodules are of a somewhat transparent, yellowish brown color which does not disappear on pressure but rather becomes accentuated in comparison with the surrounding tissues rendered anemic. Its consistency is much softer than that of normal skin and a dull probe easily penetrates into the corium. These peculiarities of color and softness make the comparison with apple jelly very appropriate. The further evolution of these pathological structures is the same as of every other tuberculous deposit, that is, degeneration and disintegration with corresponding clinical manifestations. Indolent, sharply cut ulcerations which are shallow, have an irregular, wormeaten floor and exude a thin purulent secretion. The process may heal entirely or more often partially in one place and spread at the periphery, continuing indefinitely for years. The scars, the final evidence of the disease, are hypertrophic, highly disfiguring and interfering with functions, if situated near the eyes, mouth and nose. Many textbooks assert that the destructive tendency of lupus is limited to the soft tissues and stops short of the bones, which fact may be considered a differential point from syphilis. There is however a possibility of perforation of the nasal septum or the hard palate which should be kept in mind. Unless lupus is affecting highly sensitive portions of the body, it causes little physical suffering. Frequently it begins on the mucous membranes there remaining localized for a considerable time and is then sometimes mistaken for a chronic catarrh until extension to the adjacent skin reveals its true nature. The histological changes are of the same character as tuberculous pathology is elsewhere: epithelioid and lymphoid cells and a large number of giant cells held together by connective tissue and elastic fibers. A few tubercle bacilli are occasionally, but infrequently, found along the borders of the giant cells.

Scrofuloderma is characterized mainly by a more or less circircuscribed infiltration in the subcutaneous tissue which softens and breaks down. The overlying skin appears unchanged at first but gradually becomes prominent, thinned and lividly discolored. The results of the breaking down are ulcers which are undermined, have ragged edges and indolent granulating floors. The process spreads in a straight direction forming long linear ulcerations and fistulas undermining the skin. The scrofuloderm originates preferably in tuberculous glands and occupies usually such regions, where these are present, especially about the neck. The disease is usually painless; the resulting scars are depressed, irregular, sometimes adherent to the tissues below and give forever afterwards evidence of the early diathesis. The pathological histology corresponds to that of a tuberculous cold abscess; tubercle bacilli are rarely found, but inoculations on guinea pigs are usually successful. Mixinfections with the pyogenic bacteria are common.

Tuberculosis verrucosa cutis is relatively the mildest variety and only exceptionally gives rise to serious complications. It occurs on the hands and fingers of people who handle tuberculous material and occasionally in phthisics and their relatives produced by the contact of the tuberculous sputum with their skin. The so-called postmortem or anatomical wart belongs to this class. A small limited area of the skin shows a superficial hard infiltration, slightly scaling and a dull red surface which eventually becomes transformed into a rough patch of small closely aggregated papillary excrescences. Only a low degree of inflammation and slight tendency to ulceration is present, tho occasionally tuberculous lymphangitis and general infection have followed.

Miliary tuberculosis of the skin represents the same type in relation to the skin as acute miliary tuberculosis of the lungs does in relation to a chronic tuberculous process of the internal organs. It is almost always evidence of involvement of the whole system. Its places of predilection are the mucous orifices, as the mouth and pharynx in lung tuberculosis, the anal region in intestinal and the genitals in uro-genital tuberculosis. The lesions are minute grayish or whitish spots which rapidly break down and form small superficial, sharply cut ulcerations. They are very painful and show no tendency to heal, possibly because they usually make their appearance when the patient is in extremis.

The diagnosis of the tuberculous skin diseases may be made by strictly scientific methods or from the clinical picture alone. The first way is absolutely necessary where the clinical symptoms leave any doubt. It includes microscopic examination of excised tissues which is absolutely conclusive only if the bacilli are found; this however is the exception. More important are inoculation tests on animals; most commonly used for this purpose is the peritoneum of guinea pigs and the anterior corneal chamber of rabbits. It must be kept in mind that positive results take occasionally as long as a year to realize and that their absence can not be taken as a negative evidence. Altogether too little employed, at the present time, is Koch's tuberculin which for diagnostic purposes has unquestionable value. A local reaction in the diseased skin together with a rise of temperature and general malaise after its injection is observed in tuberculous patients only. Lately the ocular instillations and rubbing the tuberculin into the skin have been used instead with good results. For practical purposes the diagnosis may be made however in most cases of cutaneous tuberculosis from the history of the patient and the efflorescences found on the skin.

The prognosis of tuberculosis of the skin and the mucous membranes depends on the general condition of the patient, the extent of the disease, the time at which it is diagnosed and treated and finally on the circumstances of the patient whether they will permit him to take thoro care of these insidious diseases or not. The prognosis *quod vitam* is favorable; while the danger of a systemic involvement from a local focus is always present, it is fortunately the exception. The prognosis as to local results can not be called brilliant even by an optimist. A few cases of scrofuloderma and lupus heal spontaneously, the majority however need measures continued for a long time which, even if successful in removing the active eruption leave disfiguring and sometimes treacherous scars.

The therapy should be prophylactic in the first place. In families of consumptives the dangers of contact with the tuberculous sputum should be guarded against; children especially should be protected by paying special attention to the care of their skin; any present skin disease, which is liable to become the opening portal for infection should be cured as quickly as possible. Enlarged glands and obstinate chronic nasal catarrhs are often the very first evidences and should be looked after carefully. Constitutional treatment is very important and should look to the building up of the general constitution. It would take too much time to go into details of all the local treatments which have been tried from time to time. The aim of whatever treatment is attempted must be the removal of the diseased tissues harboring the bacilli with the least possible destruction and consequent disfigurement and interference with functions. Practically all dermatologists are united at the present time in considering the Finsen light and the X-ray as our most valuable therapeutic measures in these affections. To give you my experience with the X-rays, I can not improve on my statement which I made before the Douglas County Medical Society some time ago in a paper on radiotherapy in dermatology. I said at that time and have not changed my opinion since: Tuberculosis of the skin must be mentioned second in order as to good results from radiotherapyin skin diseases (superficial carcinoma of the skin was mentioned first). Up to the introduction of light treatment lupus vulgaris was the bugbear of the dermatologists. Even after a cure the disfiguration from hypertrophic scars was as a rule highly annoying. At the present time most of these cases yield within a reasonable time and the after appearance of the skin is smooth and inobtrusive. A recent advantage is found in the employment of carbonic acid gas snow, which in conjunction with the X-rays promises a great improvement on our present methods.

Diagnosis and Treatment of Accessory Sinus Disease by Means of Suction

BY JAMES M. PATTON, OMAHA, NEBRASKA

The use of suction or negative pressure in conditions relative to the nose, is not entirely new, yet it is only in the last three or four years that the matter has been brought to the notice of the profession with any degree of prominence.

In July 1906 Dr. Frank Brawley, of Chicago, published an article demonstrating the use of the Victor pump for producing negative pressure, connected thru an ordinary wash bottle with a suitable nose piece, and mentioned that Sondermann and Spiess had published reports within the year on the treatment of intra-nasal conditions by means of suction. About the same time the late Dr. Geo. H. Bicknell called my attention to the same principle, using a four ounce metal syringe with an acorn shaped nose piece, with very satisfactory results. Over a year ago Dr. Geo. L. Strader, of Cheyenne, told me he was using the saliva ejecter of his fountain cuspidor, armed with a conical nose piece, to produce negative pressure, and was the first, so far as I have been able to learn, to employ water pressure for the purpose. He also suggested the use of an ordinary bicycle foot pump with the valvesreversed. I used this latter with the special nose piece which I devised, for some months, in fact until I heard of the Brawley water pump, which consists essentially of the ordinary vacuum apparatus of the laboratory; this is connected with a wash bottle by means of non-collapsible rubber tubing, another piece of the tubing armed with some sort of a suitable nose piece completing the apparatus; the ordinary acorn shaped nose piece of glass or rubber doing very well, as it is easily sterilized and does not irritate the mucus surface of the nose.

The wash bottle collects the material which may be drawn from the sinus and also prevents clogging of the pump, and is easily cleaned. It is only necessary to draw a stream of hot water thru it each time it is used. The management of the apparatus is very simple and the patient can be taught to use it himself in a few minutes. First remove all crusts and secretions from the nose with cotton swabs, and reduce any tumefaction by spraying with a weak solution of cocain. Regulate the degree of suction desired by the faucet, insert the nose piece well into the nostril that its opening may not be occluded by overlapping of the flexible nasal wall, the other nostril held shut and the pharynx closed by having the patient sound the first half of the letter K, by blowing forcibly into the cheeks, by the act of swallowing or opening the mouth very widely, or by a very forced inspiration. As some patients experience a little difficulty in closing the pharynx it may be necessary to try various methods. The treatment is continued from five to twenty minutes as indicated later.

The value of position must not be overlooked, it being of value to have the head held in such a way that the ostium of the sinus under examination, or that you wish to drain, may be as dependent as possible.

For private calls or when it is necessary to supply the patient for home use I have been employing the small suction apparatus supplied with the ordinary mechanical cupping outfits found on the markets. This may be combined with some special nose piece to prevent clogging the pump with secretion.

The theory upon which this treatment is based has been pretty carefully worked out by different observers, both in this country and in Europe, and in the main is as follows: When a focus of infection is present, e. g., in one of the accessory sinuses, ear, etc., nature at once attempts to combat the invasion by throwing out an exudate rich in bactericidal serum. The efficiency of this serum depends in a great measure on the facility with which serum low in bactericidal power, as it must be, after contact with the active infection, can be replaced by fresh serum of a high resistance. It is at this point that suction has the advantage of the compression method of producing a similar result, as practiced by some, especially in Europe, who have reported unfavorably upon its use in treatment of sinuitis, etc. The reason for this is obvious, for while the compression method may yield an increase of the serum present, it results in stasis, both thru the blood stream and also by back pressure from the arteries, which in a short time reduces the vitality of the serum so that it not only does not inhibit the infection, but may even be the means of its more rapid advance.

The suction method on the other hand, not only removes the germ-laden secretions and non-resisting serum, but also floods the tissues and bathes the surfaces with fresh serum rich in resistance, at the same time stimulating the local circulation.

As an aid to diagnosis in the obscure borderline cases in which there is headache, weariness on close application, or a sensation of dullness in or about the eyes, with no error of refraction or muscle insufficiency to account for it, *even when examination fails to show any pathological conditions in the nose,* the use of suction not infrequently will reveal the presence of pus in one or more openings of the accessory sinuses.

Again in cases where there is direct evidence of sinuitis it is sometimes not easy to tell which or how many of the cavities are affected. By carefully cleansing the nasal cavity and applying suction the offending cell or cells can usually be detected by the locality of the presenting secretion.

In my own limited experience I have, with but few exceptions, used the suction in connection with other recognized forms of treatment. There is no doubt that its therapeutic action is greatly increased thru establishing free drainage by position, by the removal of polypi, hypertrophies, etc., and by free lavage of the cavity with a warm alkaline solution. I will mention a few cases that will illustrate the application of this method.

Case I. Mrs. G. aged 34, previous history negative, intense frontal headache accompanying a severe cold. Examination showed marked congestion of the nasal mucosa with tumefaction of the turbinal bodies, the middle meatus being almost entirely closed. Treatment:—After shrinking the tissues with a weak solution of cocain, suction was applied for five minutes, when the pain was entirely relieved. The usual measures were taken to relieve the congestion by internal medication. The patient returned the following day, some headache, which disappeared after a few minutes use of the suction. Did not return for further treatment. In this case there was no pus present.

Case II. T. P. aged 55, complained of pain over eyes. Errors of refraction corrected. No history of discharge from nose, could not breathe well thru right nostril. Moderate sized spur removed from right side of septum. Suction not tried. Returned nearly a year later, good breathing space, but still has pain, worse over right eye. Transillumination showed right frontal region decidedly cloudy. Patient of rather low vitality not well nourished. Treatment:—Tissues contracted in usual way and suction applied for ten minutes resulting in free discharge of pus in anterior part of middle meatus, relieving pain. As the right middle turbinate was rather boggy I resected the anterior one-third and continued use of suction for from ten to fifteen minutes daily, combined with lavage, etc. The patient could not be induced to stay in a hospital and suffered from a severe attack of la grippe which retarded healing; however, he went home at the end of three weeks with entire relief from distressing symptoms. I supplied him with a small suction apparatus with instructions to use it if there should be any return of symptoms.

Case III. Mrs. V. consulted us in the fall of '08 for loss of vision in left eye, with severe pain in frontal region extending to occiput at times. Gave no history of nasal trouble, but mucosa found to be congested and both middle meatal regions tightly plugged with turbinal hypertrophies. Anterior third of middle turbinates resected, improvement in vision promptly followed, patient went home, no suction tried. She returned in January '09 with vision normal in both eyes with correction, but complained of very severe pain in right frontal region extending to back of head. Transillumination negative. Treatment:— Cocainization and suction revealed pus in posterior part of right middle meatus. The remainder of the right middle turbinate was removed and the post-ethmoids exenterated with improvement of the frontal symptoms. However, occipital pain continued, which disappeared entirely on removing the anterior wall of the right sphenoid sinus, establishing free drainage. There was some frontal headache for several days, worse in morning, disappearing after each suction treatment, when there was a free discharge of pus from the ethmoidal region. This rapidly improved and the patient was sent home with instructions to use the small suction pump two or three times a week. I heard from her a few days ago, she reports herself free from pain and other symptoms.

Case IV. E. J. aged 43, complains of profuse fetid discharge from right nostril, right middle turbinate hypertrophied and bathed in pus, left middle turbinate apparently normal. No tenderness over frontal regions, transillumination doubtful, due to very thick superorbital wall. Treatment:—Cocainization and suction. Evacuation of three or four drams of very offensive, yellowish pus. Half of right middle turbinate resected and anterior ethmoids exenterated. Daily suction and lavage, free evacuation of pus for two weeks, but no odor after third day. Discharge much reduced after second week. Is now getting two treatments a week with constant improvement.

Case V. Mrs. P. aged 35, had asthma three years ago when about one-third of both middle turbinates were resected with prompt relief of symptoms. Now complains of frontal pain worse on right side, mucosa congested, sigmoid deflection of septum, some hypertrophic nodules in right middle meatus. Treatment:—After shrinking tissues, suction applied for ten minutes with relief of headache, which returned in moderate degree by next morning. Treatment continued daily for a week when symptoms had entirely disappeared. Patient sent home with small pump and instructed to continue its use.

Other cases could be mentioned, but these well suffice to show the application of this method. Of course, this is not applicable to all cases of sinus disease, but if we can by its use aid drainage and secure healing with a minimum destruction of the tissues the resulting comfort to the patient certainly warrants its trial. Altho I have been employing this method but a comparatively short time and would scarcely be in a position to express a definite opinion as to its value, yet the favorable reports of such men as Brawley, Strader, Lewis, and others who have been employing the suction method the past three or four years, agreeing so fully with the satisfactory results which I have secured, convince me that we have in it a real addition to our equipment for the handling of these cases, of value not only to the specialist, but to the general practitioner as well.

THE BULLETIN
OF THE
UNIVERSITY OF NEBRASKA
COLLEGE OF MEDICINE

HENRY B. WARD, Dean, Lincoln HAROLD GIFFORD, AssociateDean, Omaha

THE BULLETIN is published quarterly in January, April, July, and October, by the University of Nebraska, at Lincoln, Nebraska

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Single numbers of THE BULLETIN may be had for 50c each. Complete volumes or subscription by the year $1.00

All communications relating to THE BULLETIN should be addressed to
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EDITORIAL

Progress of the College

Among the appropriations made by the last legislature was an item of $20,000 for the purchase of a site for a medical campus in the city of Omaha. This may justly be regarded as a most important epoch in the history of the institution. The highest legislative authority in the commonwealth has passed upon the location of the clinical department of the college and has established it definitely in the great metropolis of our state. While this decision was reached by the Board of Regents at the time when the Omaha Medical College became a part of the University yet it needed some positive action by the legislature to settle beyond possibility of cavil the question of location. With the purchase of a medical campus in Omaha, all doubts and questionings on the part of both friend and critic are finally at an end.

The Board of Regents has appointed a committee consisting of President C. S. Allen, Chancellor S. Avery, Dean Henry B. Ward, and Doctors Jonas, Bridges and Findley to receive tenders of land and recommend to the Board that site which all in all seems to be best adapted for the purposes of the College. The Committee is expected to make an early report and the land already placed at its disposal furnishes several admirable sites for a medical campus.

After the ground has been selected the next duty of the University will be to secure appropriate general plans for the entire medical plant which is to occupy the clinical campus. This will include a group of eight to twelve structures according to the size and character decided upon for individual buildings. If an appropriate partition of the entire tract, a dignified style of architecture, and a congruous grouping of the various units are decided upon before work begins the University may hope to develop the medical campus in a manner worthy of a great city and a great institution. Nothing should be permitted to stand in the way of such a plan and every step should be taken in full consciousness of the future demands and possibilities in medical education.

The plans for the development of the College received material assistance thru the suggestions of Mr. A. Flexner who in behalf of the Carnegie Foundation for the Advancement of Teaching conducted a most rigorous examination of our facilities recently. Mr. Flexner is carrying thru a complete inspection of medical schools on this continent and does not hesitate to call attention to weak points in the organization or methods of the strongest institutions. His comments on various prospective campus locations and on the general plans for the development of the institution were particularly welcome at this stage of progress. The University is indebted to him for many valuable criticisms which will be incorporated in the working out of detailed plans and it also appreciates the words of encouragement he proffered in commendation of the steps already taken and the plans in hand for future progress.

The hard work of the past seven years is being abundantly justified in the results of student training and in the recognition accorded the College at home and abroad. The members of the faculty, our alumni and all friends of the College are entitled to regard with real satisfaction the progress already made. But even greater things lie before us in the near future and will come on the heels of the new campus and the plans for the new College plant.

COLLEGE NOTES

At a luncheon tendered Professor Flexner, who has been inspecting the university college of medicine on behalf of the Carnegie Foundation for the Advancement of Teaching, by Dean H. B. Ward, the visiting professor highly commended the work of the Nebraska school.

He spoke voluntarily to Chancellor Avery and others present in commendation of the strong foundations which had been laid here for a medical college, commenting upon the balance of the course, the thoroness of the work, the earnestness of the students, and the evidently good results achieved. He expressed the hope that the college might receive better quarters and that the heads of departments might be given more assistants to relieve them of the unduly heavy burden involved in preparing material for class use. He congratulated the college upon the vote of the legislature which assures a suitable campus in Omaha and urged that the clinical work should be further developed along the line of the German schools, which by virtue of several centuries of experience have perfected medical education to a degree unknown elsewhere.

Mr. Flexner warmly praised the individual teaching in laboratory and clinic and certain other details in the methods employed which he said could not be found elsewhere west of the Alleghany mountains. He urged that the college continue to place its emphasis upon the quality of work and await confidently the general recognition which it would be sure to win, if the present policy was maintained. In the opinion of Mr. Flexner the medical schools of the country will ultimately be reduced to one tenth of their present number. He was confident that Nebraska had all in all the best school in the west. Mr. Flexner left for Denver and the Pacific coast and before his return to New York will have visited every medical school in the United States.

Beginning April 25th the second annual practitioners' course of the college of medicine began its work. Nearly a score of practicing physicians from over the state were in attendance, seeking to learn by practical demonstration the latest things in medical science. The course continued thruout the week.

The practitioners' course was inaugurated last year. At that time only seven or eight physicians enrolled, but the work went thru without a hitch. This year the number was doubled and the course enlarged to meet the variety of needs. Lectures and demonstrations were given each morning and afternoon and three meetings were held in the evening.

The course is intended to give to country practitioners a chance to see by demonstration the new things in medical science, such as do not ordinarily fall under their observation. There are many new discoveries which cannot properly be made clear thru the medical literature, but which may be plainly demonstrated in the laboratory. It is these which are made clear to the visiting physicians.

The idea of such a course is taken from the University of Vienna in Austria. For several years this school has annually had such a course and it is attended by physicians from all over the empire. Comparatively few of the schools in America have undertaken the establishment of a similar department, but the Nebraska authorities have been much satisfied with the workings of their venture.

Monday evening Dr. Lyman, head of the department of pharmacy, gave a lecture on "The Relation of Pharmacy and Medicine." Wednesday evening Dr. Guenther spoke on "Some Aspects of Mental Therapy." Friday evening the visitors were the guests of honor at the regular meeting of the pathological club at which Dr. Woolley of Omaha was the principal speaker.

The regular program for the week was as follows:
Monday a. m.—Dr. H. W. Orr, Orthopedic hospital.
Monday p. m.—Dr. H. H. Waite, bacteriological laboratory.
Tuesday a. m.—Dr. Poynter, anatomical laboratory.
Tuesday p. m.—Dr. Wolcott, anatomical laboratory. Dr. Willard, histological laboratory.
Wednesday a. m.—Dr. Everett, Everett sanitarium.
Wednesday p. m.—Dr. Orr, Orthopedic hospital.
Thursday p. m.—Dr. Guenther, physiological laboratory.
Friday a. m.—Dr. Lehnhoff, demonstration laboratory.
Friday p. m.—Dr. Lyman, pharmaco-dynamics laboratory.
Saturday a. m.—Dr. Pillsbury, state insane hospital.
Saturday p. m.—Dr. Dales, chemistry laboratory.

The Swedish Immanuel Hospital will soon have completed its new pavilion. This will more than double the present capacity of the hospital and will greatly increase the clinical facilities of our school. Dr. Prichard, '08 has been retained as house physician and surgeon for another year and B. L. Myers, '09 has received the appointment as interne for the coming year.

Dr. Fitzsimmons, '02 of Tecumseh gave most valuable assistance in procuring the appropriation of $20,000 for a site for the Medical Department of the University of Nebraska. We are grateful for his services and for those of other members of the alumnae and student body. Such demonstrations of loyalty to our institution are most gratifying.

The new Bishop Clarkson Memorial Hospital is nearing completion. This will be one of the most complete and artistic institutions of its kind in the west. Two graduates of medicine will be appointed as house physicians and surgeons. Our faculty is largely represented on the staff and it is expected that this hospital will provide large clinical facilities for our students.

Dr. Harry Benson, '03, who has been connected with the Institute for the Feeble Minded at Glenwood since his graduation, has purchased Dr. Sward's practice in Oakland and will reside there in the future.

The committee for the selection of the new site for the Medical Department is composed of the Chancellor, President Allen of the Board of Regents, Dean Ward, Dr. Jonas, Dr. Bridges and Dr. Findley. They are considering a number of locations which have been offered to them.

R. W. Christie, H. L. Mantor and O. W. Wyatt of the class of 1909 have been appointed as internes at the Methodist Hospital from June 1st, 1909 to June 1st, 1910.

Dr. C. C. Morrison, '03 has returned from a very beneficial and enjoyable trip. He spent three months taking post-graduate work in Chicago and New York.

Dr. C. C. Tomlinson, '08 who has been house physician at the Douglas County Hospital since June has now located at Elm Creek, Nebr. Dr. Charles Lieber, '08 has taken his place at the County.

Dr. Schalek read a paper on "The Therapeutic Value of Carbonic Acid Gas before the Medical Society at Carroll, Iowa on April 23.

On February 25 the board of directors of the Western Medical Review selected Dr. H. Gifford to succeed Dr. Bicknell on the board of directors and Dr. Paul G. Woolley as associate editor.

Dr. D. R. Brower of Chicago died March 1 from a cerebral hemorrhage. He will be remembered by the University College of Medicine as its Commencement Orator in 1903. His commencement address was marked by its breadth of view and grasp of the questions handled and was the first in a series of great modern presentations that have characterized the commencement exercises in recent years.

The University of Nebraska has just been admitted to membership in the American Association of Universities, according to an announcement just received by the chancellor's office.

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VOL. IV JULY, 1909 No. 3

THE BULLETIN

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UNIVERSITY OF NEBRASKA

COLLEGE OF MEDICINE

Published Quarterly by the University

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LINCOLN, NEBRASKA

ENTERED AT THE POST-OFFICE IN LINCOLN, NEBRASKA, AS SECOND-CLASS MATTER UNDER ACT OF CONGRESS, JULY 16, 1894

CLINICAL FACILITIES

OF THE

University of Nebraska College of Medicine

THE COLLEGE DISPENSARY
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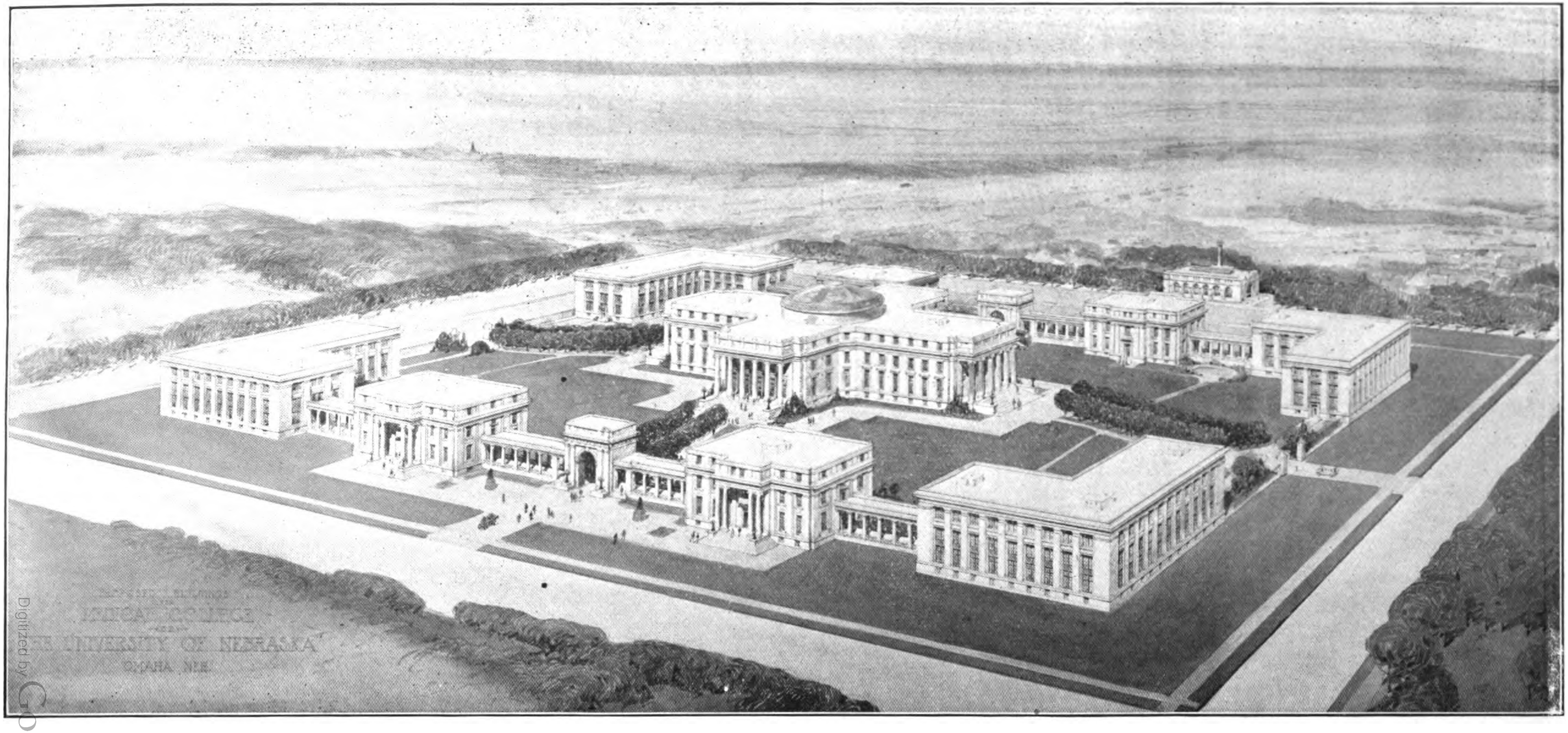
THE IMMANUEL HOSPITAL
THE DOUGLAS COUNTY HOSPITAL
THE CLARKSON MEMORIAL HOSPITAL
THE WISE MEMORIAL HOSPITAL
THE CHILD-SAVING INSTITUTE
THE JENNIE EDMUNDSON HOSPITAL
THE TINLEY RESCUE HOME
THE SWEDISH HOSPITAL



Proposed buildings and campus of The University of Nebraska College of Medicine, Omaha, Nebraska

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*Educational Ideals in Medicine**

BY W. W. KEEN, PHILADELPHIA, PENNSYLVANIA

In the fifty-four years since I entered my own alma mater—Brown University—as a freshman (pray, do not think me an antediluvian; 1855, I assure you, followed the memorable catastrophe of the flood at quite a long interval!) it has been my privilege to know among my fellow alumni a number of its distinguished sons. In public life there were Richard Olney, John Hay, fellow students, though not fellow classmates (how little did I realize what distinguished careers were before them), Charles E. Hughes, already thane of Glamis and of Cawdor, and I hope king hereafter, and Everett Colby, whose fine record is known of all men. In academic life, besides others of lesser note, there were four eminent college presidents, Angell of Michigan, Wheeler of California, Faunce of Brown, and, last but by no means least, my warm friend for nearly two-score years, President Andrews of Brown—Chancellor Andrews of Nebraska.

When, therefore, Dr. Andrews invited me to deliver this address, I was glad to oblige him and glad to make your acquaintance. My only regret is that he, your beloved leader, is absent; and I regret it the more because ill health is the reason. Another beckoning influence was my desire to spy out the land, for, even when I graduated, Nebraska was a wilderness without a railroad and without a city, not to speak of a university. Then Omaha had a population of only about 1,800 and the whole state only 25,000, while the university was not founded till 1869.

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*The address at the commencement of the Medical Department, University of Nebraska, Omaha, May 20, 1909.

*This address appeared in the Journal of the American Medical Association of June 26, 1909.

I was much impressed lately by an address before the American Association for the Advancement of Science by Professor Royce of Harvard. He said: "The center of gravity of our future American academic life can not always—can not, I think, very long—remain east of the Alleghenies. Through a perfectly natural and inevitable evolution the state universities of the middle west and of the far west, supported as they are, and will be, by the vast resources of their own communities, and guided by constantly improving educational ideals, will, within a generation or two, occupy a very nearly central place in the academic life of our country."

When I look at the splendid appropriations for their state universities by the legislatures of Nebraska, Minnesota, Michigan, Wisconsin, Illinois, and other western states, when I see the superb work done at these great institutions, and when I find that your own state has the lowest percentage of illiteracy of any of our many states, I am persuaded that the center of gravity is moving westward even more swiftly than Professor Royce intimated.

I am here, therefore, at your call and thank you for the great honor you have done me.

Professor Royce's mention of "Educational Ideals" has suggested my subject—"Educational Ideals in Medicine." By education, however, I do not mean solely that of the school and the college. The home gives us our first and most important and lasting education. If its atmosphere is low and sordid, sordid and low will we surely grow up. The marts of trade, the social life we live, the books we read, the newspapers we scan, the sermons and lectures we hear, the friends we talk with all educate us, no less than the formal training of the school, the university, and the professional school.

The following are some of the educational ideals in medicine:

I. THE IDEAL IN ACQUISITION

This may and ought to consist to a proper extent in the acquisition of money, and if we have the ideals I shall name later the more money we acquire the better for ourselves and for the community. A due reward for our labor and skill is both right and desirable. We must provide for ourselves and our families, and must lay up a store against old age or the "rainy day" of sickness or accident. If opportunity comes, we should strive to acquire still more, but never as the miser who merely adds bond to bond, mine to mine, million to million, and from time to time gloats with glee over his growing hoard, but as the fountain which gathers from every passing cloud the showers that filter through the soil away down below the surface of many broad acres and then distils it in limpid purified streams of water to the gladdening of the parched land and the joy of the thirsty traveler.

But remember the warning of our Lord—recorded, be it observed, by the medical evangelist Luke—"Take heed and beware of covetousness; for a man's life consisteth not in the abundance of the things which he possesseth." A man's *living* may depend on these carnal things, but his *life* depends on far better and more important things.

Besides money, we must acquire knowledge, not only in college and in the medical school, but all through our lives. Here let me urge you earnestly to lay broad and deep the foundations. The superstructure can never be imposing unless the foundations are solid. To a common school and a high school education, add, even if you have to work your finger-nails off, a college training in both the ancient and the modern languages, in mathematics, history, literature, rhetoric, and logic before you tackle the "ologies" in the professional schools.

The other day I read an otherwise excellent medical paper by a promising young man, when suddenly the cold chills ran down my back as I ran across the words "in conjunction with a clinical data." One might as well say "a handsome women." Only by high achievement can he remove the blight cast on him in my mind by that single phrase. It shows that his education has been defective, just as chewing gum or feeding one's self with a knife shows that home training in good manners was lacking. Great geniuses will get to the top of the ladder in spite of such defects, but to the average, or even to the strong man, these fundamental educational defects will always be a handicap.

Moreover, when your time is absorbed in a successful practice it is difficult and sometimes almost impossible to cultivate the humanities and the "literature of power" which add so much grace and charm to the sturdy strength of the "literature of knowledge."

When you have laid a good foundation in a liberal education, then begin your professional studies and work as if your life depended on it. Four years of constant labor are too few to master the great "corpus" of medical knowledge. Your faculty, able as they are, can not give you more than a mere smattering of knowledge, only the A B Cs of what you must later learn for yourselves. But they can do two great things for you. They can teach you the methods by which they have gained, and you can gain, a thorough knowledge of medicine. I would rather teach a man how to study and teach him ten facts than a thousand facts and no method. In the long run the first man will reach the goal, while you won't be able to find the second man with a spy-glass.

Second, they can inoculate you with the virus of enthusiasm, when you will be immune from fatigue, from laziness, from indifference. Like your teachers, you, too, will be idealists, who, all aflame with zeal, will scale the heights of faith and drag the rest of the world up after you.

If you have learned how to study and the bacillus of enthusiasm has developed its intoxication in your system, then, after your graduation, you will begin your long years of real study which will make you an educated physician. Any one of you who fails to study, and study hard, for the next forty years will be left high and dry. To change the metaphor, if you are determined to climb high up on the ladder of knowledge the community will be glad to help you; if you are content to stand at its foot, you are not worth helping!

II. THE IDEAL IN ACHIEVEMENT

This foreshadows the second ideal for which the new century holds its laurel crown—the ideal in achievement.

You must not be content with only acquiring existing knowledge; for what is present knowledge but the accumulated discoveries and inventions of our forbears? If we act only as sluiceways to pass on this fund of knowledge to our successors, we fail of one of our highest duties—to add to existing knowledge by our own researches.

You may not, it is true, be a Jenner, a Pasteur, a Lister, or a Koch, for they are volcanic forces in the world of science that create continents or lift up mountain ranges. Yet, when these very giants sat on the hard benches of the medical school as young fellows, what one of their teachers ever dreamed of the great work they were to do? At sixteen Charles Darwin was considered "a very ordinary boy, rather below the common standard in intellect," and even at twenty-two he seemed destined to be nothing more than "an idle sporting man."

But you can all add something to the sum of knowledge. The joy of the discovery of a new truth, a new means of diagnosis, a better method of operating, a new serum for treatment which may save hundreds and even thousands of human lives sets the nerves a-tingling with joy and fills the soul with satisfaction as naught else can do. You can have this joy if you will. One of my own Jefferson boys, now Professor Rosenberger, has just accomplished such a feat by discovering a method by which the tubercle bacillus can be discovered in the blood long before it appears in the sputum. By its means he has diagnosticated, for instance, a brain tumor, and a tumor in the neck to be tuberculous and not a sarcoma, and made many other similar diagnoses which operation or necropsy has proved correct. I regard it as the most important and most far-reaching discovery as to tuberculosis since Koch's own discovery of the bacillus itself twenty-seven years ago.

Why, then, should not you go and do likewise?

III. THE IDEAL OF SERVICE

The third ideal for you to realize is the ideal of service. Your very bill-heads will remind you constantly of this, for will they not read "Mr. John Smith, to John Jones, M. D., Dr. For Professional Services" so much?

It is a clumsy way of reckoning, however, for who can reckon in coin of the realm the service rendered by the saving of a precious life to kindred and to the community? Who can transmute into paltry dollars the care and skill and learning that shut the door on death? Moreover, to whom shall Flexner and Jobling or Rosenberger render a bill for "professional services to mankind" by the discovery of the antiserum for cerebro-spinal meningitis or by the discovery anent the tubercle bacillus? Who will pay it? No one! Remember that "only the lower things of life are sold; the higher things are always given."

The service you will render will always be a personal service, often at the expense of sleep, of comfort, of home joys, of recreation; but, believe me, it pays, as personal service always does. Remember that yours is not a trade, but a profession. "The object of a trade is to make money; the object of a profession is to bless mankind." This ideal of personal service can never be fully realized by others, or, indeed, rendered by others, but only by those of our own guild.

But, ladies and gentlemen of the audience, let me for a moment address you instead of the graduating class. To you of this audience, this city, and this state it is given to assist in this great work, not by your personal labor, but by your appreciation, your encouragement, and your financial aid. Among these young men there are not a few who, like many of my boys at the Jefferson, are longing to devote their lives to research, to discover means by which disease shall be defeated, epidemics lessened or abolished, homes made happy and mankind be blessed. Look at what I have seen accomplished in my own not overlong life; anesthesia, antisepsis and asepsis, the greatest gifts to mankind since the days of Jenner; yellow fever abolished; malaria put in leash; the *x*-rays discovered; the trichina discovered and its life-history and the easy method of destroying it ascertained—and what that means to Omaha, I need not explain to you; the mortality of cerebro-spinal meningitis reduced from 75 per cent. and more to 25 per cent. or less; the tubercle bacillus discovered; and now an early diagnosis in the curable stage made possible; ovariotomy and nearly all other abdominal operations made so safe that the time seems not far off when the well will almost envy the sick the fame acquired by having undergone a big operation! But, seriously, if these and many more similar discoveries have been made in the last sixty years, why may not one—or more—of this very class now graduating thus honor himself and this university and all Nebraska if you give him the opportunity?

The expense of a thorough medical education has grown enormously within the last twenty-five years. Instead of teaching large classes by lectures and a few diagrams we now need large and expensive laboratories, expensive to equip and more expensive to maintain, and the number of teachers must approximate the number of students, for instruction is now largely to individual units rather than *en masse* or even to small classes.

If from among its graduates in medicine the University of Nebraska should send forth one Pasteur, one Lister, one Virchow, or one Koch, or even one lesser light, would not it justify its entire existence and make the whole world its debtor?

I plead with you, therefore, for the erection and endowment of laboratories of research right here in Omaha amid its teeming thousands and its busy industries—one spot where the idea of gain shall be excluded and the idea of service shall be all-absorbing and all-dominating.

You are very practical men, you Nebraskans, and will naturally ask how much it will cost. Not less than a million—one-quarter for buildings and an endowment of three-quarters for salaries and running expenses. A half million will do for a starter, but the other half must be had to make a success. But you may object that "that is an enormous sum for us to give." True, but I have never known the West to refuse a "dare," especially from an Eastern "tenderfoot." Moreover, let me tell you that this sum is small compared with what your research fellows and professors will give in dollars, to say nothing of their enthusiasm, their unselfish lives and the gifts they will give to mankind. One million dollars, if safely invested, can not bring in an income of more than $50,000 at the very outside. Yet I know one research worker, a man without substantial means, who, if he entered the arena of surgical practice would easily receive $50,000 or more a year, but who deliberately rejects this splendid income and is working for the modest salary of $3,000 a year for the joy and the reward of this work in the discovery of new truths which he has freely given to the whole world. He is giving, mark you, out of his poverty to the community the income of a million of dollars or more. Until you match that by equally liberal gifts you must doff your hats to this devotee of science as more generous than yourselves.

IV. THE IDEAL OF CHARACTER

The fourth ideal which the twentieth century demands of you is the ideal of character. You may win fame, fortune, and power, but, unless you win also a pure and lofty character, the rest will be but apples of Sodom turning to ashes at the slightest touch. "If you want to know what people love most," says the *Outlook*, "do not go into their shops and factòries; find out who their heroes are; for the hero always embodies, more or less perfectly, the real aspirations and the fundamental desires of a people. Who are the heroes loved by Americans? Washington, Jefferson, Franklin, Lincoln, Grant, Lee, Stonewall Jackson, Emerson, Beecher and Brooks. Now it is significant that not one of these men was a great material organizer in the acquisition of wealth. All the American heroes have stood for devotion to principle, for love of liberty, for consecration to the interests of humanity, for apostolic fervor in preaching the religion of Christ, for a noble idealism in interpreting America in terms of spiritual opportunity and achievement."

"To prepare ourselves for sudden deeds by the reiterated choice between good and evil, gradually determines character," says the author of "Romola." Tested by this scale, how high is the honor of your chosen profession! Whenever you close your office door on a woman patient you give your reputation freely into her hands and she her honor into yours! How rarely is this high trust abused by either the one or the other! In my opinion our profession stands preeminently for this ideal of character.

Hear, then, my last word to you. Up and be doing, you new graduates of a splendid foster-mother! Take part in the fray! Don't be merely onlookers, fossils of 1909, but throw yourselves with all your magnificent western vigor and vitality into the very midst of the fighting. Stand on "the firing-line of scientific advance" and win renown for yourselves and for your university by the greatest possible additions to science and the largest possible service to humanity.

Surgery of the Omentum with Report of Case of Lipoma

BY C. W. M. POYNTER, LINCOLN, NEBRASKA

Almost nothing has appeared in literature on the surgery of the omentum except as it is involved in some other pathological process: and indeed very few writers have made any recognition of a separate pathology for it.

Modern anatomists have copied largely from the older works being satisfied with the statement that it consists of a double fold of peritoneum and then explaining how during development the rotation, growth and change of position of the gut throws it into its normal position. If we look more closely into its anatomy we find that it is a reticular net work of connective tissue containing according to embryology four layers of peritoneum that are not demonstrable. It has a very free arterial supply coming from the right and left epiploic arteries and a venous supply emptying into the portal system. The lymph radicles are very numerous and empty into the glands at the greater curvature of the stomach. It is probable also that haemo-lymph glands of the splenic type are also present. Nerves aside from the vaso-motor and trophic type have not as yet been demonstrated. Variable quantities of fat are always present in the connective tissue but this does not obtain to the extent that it does in some of the lower animals. The omentum then presents a structure that contains all of the possibilities for a varied pathology.

The position is somewhat variable, it is attached to the greater curvature of the stomach and the transverse colon with the other borders free, also both surfaces are free. It is stated by Robinson that in ten per cent of cases it does not extend below the transverse colon and in twenty per cent it extends into the pelvis; but these estimates are disputed by many surgeons, his examinations were made on the cadaver and we know that when the abdomen is opened during life the omentum reaches into the pelvis in a large majority of cases. The position is dependent upon the intra-abdominal pressure, peristaltic action and respiration. There is little doubt that during a given period it comes in contact with every portion of the peritoneum.

There is still some controversy over the exact histology of the omentum but the claim of von Rickenhausen that stomata are present on the surface has been refuted by Muscatello and others.

Formerly no function was claimed for it but that of a thermal protection for the intestines and a few experiments have proved it to be valueless in that role. Crile is of the opinion that under conditions which increase the blood pressure of the portal system the omentum may act as an equalizer. Others hold that it is a large factor in the absorption of fluids from the peritoneal cavity and in case of local infections which cause congestion it will by contact with the part carry away the excess blood and relieve the trouble. The property of the omentum to form an adhesion with any surface of the peritoneum that is not normal is familiar to every surgeon but this may not be included among its functions for this is a property common to all peritoneum.

The protective action has recently been emphasized by a number of experimenters notably Pirrone Schletzler and Ewald. Their experiments show that it has a tendency to become adherent about any offending material encapsulating it and eventually absorbing it. Opii and Rodgers insist that it has a phagocytic action and think that its principal role is one of protection against infection by the rapid transudation of phyagocytic from its vessels which attack infections and carry them away. Experiments just published by Schefferdecker corroborate the view that it has a protective action but he disputes any physiological action declaring that it acts as any other portion of the peritoneum.

Late experiments of Pirrone lead him to think that it has an actual physiology and that in splenectomized animals its compensating hypertrophic process is apparent and that it tends to assume the function of the spleen.

Jacobson has experimented on a large number of dogs removing the omentum entirely then later killing them. He was unable to find that its absence had had any effect on the animals whatever and very careful research failed to show any pathological change in the liver, stomach or spleen.

I think that I am safe in saying that while investigations have shown that due to its great mobility it may assist materially in a protecting role we are not justified in looking upon it as having any independent function which would warrant us in assuming that it is an organ.

The pathology is varied and has been collected with some difficulty. Traumatism may occur with rupture of blood vessels and severe hemorrhages. These injuries seem more likely when the structure is adherent.

Up to date 68 cases of volvulus have been reported. These do not include the many cases where a portion of the omentum may be strangulated in a hernia sac. It is interesting to note that in only one of these cases was the diagnosis made before the structure was exposed.

Three cases of multiple abscess have been collected. These cases refer to infection confined entirely to the omentum. In all twenty-two cysts of the omentum have been reported; sixty-five per cent occurring under the age of twenty and seventy-five per cent in females—of these two were dermoids and the majority of all cysts were without capsule. Only one of the cases had a history of traumatism and the contents were so varied as to make the etiology obscure. Rockelansky's idea is that these tumors are of lymphatic origin and result either from the destruction of the lymph vessels or of cystic degeneration of a node. It would appear that they are of congenital origin. Twenty-three cases of primary sarcoma of the omentum have been reported. I believe in every instance they have been diagnosed only on post mortem or exploratory laparotomy. These do not include cases like Elder's where other structures were also involved.

Of carcinoma I can not as yet speak so accurately. A few cases of primary cancer have been found but the greater number in which the omentum is involved are secondary to the involvment of some other organ and I have found great difficulty in separating the cases of primary and secondary cancer.

Of lipoma or fibro-lipoma only seven cases are on record as far as I have been able to discover. The report appended will make the eighth. One by Peraire 1902, another by Malapert in the same year, Meredith 1886 reports another, then Modelung 1881, Wells 1867, Burdick 1853 and Kellog 1854 each report one case. In few of these cases the tumor was removed during life.

The remaining pathology of the omentum depends on its position and is consequently more or less dependent on the pathology of other structures. It is a factor in a large per cent of hernias. In many infections with adhesions it forms a part of the mass of adhesions. It may form a post operative complication of abdominal operations because of its growth to some structure.

SYMPTOMATOLOGY

I am entirely at a loss to give any symptoms that would belong to traumatism of the omentum, that would not be present in injuries of the abdomen in which it might or might not be involved. The obscurity of the condition of volvulus is sufficiently evidenced by the fact that only one case was diagnosed. The symptoms of strangulation with no obstruction of the bowels and the sudden appearance of a freely movable tumor should make us suspicious of the condition. Again most of the cases have occurred in connection with hernia. There is then pain, abdominal distension, vomiting—some fever and when a tumor can be made out which has come on quickly it will be of a doughy consistency and admit of more movement than any tumor limited by a mesentary. I would suggest in all cases of hernia with symptoms of strangulation when exploration of the sac fails to reveal a condition of strangulation we should always examine the omentum.

In case of tumors a well defined margin will be constant, the character of the tumor may be revealed by the general condition of the patient, that is as to whether it is benign or malignant. In the early stages and before the tumor has become large since the omentum has no physiological action it is obvious that small tumors may be present with absolutely no symptoms and symptoms will only appear when the growth has attained a size that will cause abdominal distension, pressure symptoms and by the drag on the stomach and colon cause digestive disturbances. In the cases studied the first trouble was thought to be entirely with digestion and in the cases where pain was present it tended to radiate toward the liver. Then to sum up—there may be pain in the upper abdomen radiating to the right, anoreia, dyspepsia, vomiting, constipation alternating with diarrhea and in malignancy.

A physical examination will show a movable tumor which unless adherent will move through an arc with the greater curvature of the stomach as a center, its outline may be clearly made out and it will be in front of the intestines and yet behind the abdominal wall. It may resemble a movable kidney but will rarely have the same shape and consistency and its field of mobility is not the same. Also a long pedicled ovarian cyst may closely simulate it but the Trendeleberg position will reveal the attachment of the cyst.

Wetzel has noticed movement of the tumor with intestinal peristalsis, Aganeser calls attention to the fact that the tumor does not move with respiration while Pean observed that the tumor is of superficial location, has abnormal passive mobility causes no functional disturbance and is limited downward.

While recent investigation has seemed to show that the omentum is not entirely without function I do not believe that we can go to the point of some enthusiastic investigators and view it as an organ that is to be conserved at any cost. In the cases I have collected the omentum has been removed repeatedly without any apparent inconvenience or after complications to the patient. In most of the pathological conditions partial or complete removal is the only treatment.

In surgical work on the omentum it must be kept in mind that the structure is very vascular and all bleeding points must be firmly secured to prevent secondary hemorrhage. In tying off the work must be done carefully not to have long stumps that may necrose. Only catgut should be used for the work that no material may remain to later act as an irritant. At the line amputation the surface should be carefully turned in to prevent adhesions which may give us an irritable stomach or worse.

Its further surgery is a part of other conditions and consists of its employment in covering denuded areas, covering defects in the stomach and bowels and in relief of the portal circulation in cirrhosis of the liver.

CASE HISTORY

Woman age forty-four. Mother of one child, daughter. Family history negative. Personal history that of any housewife who has had to take care of a home and added to that sewing for decade or more.

During the last five or six years past has been very nervous. This was attributed to a laceration which occurred at the time her child was born some eighteen years ago. In the past year has noticed a bearing down pain coupled with a dragging of the abdomen and occasional irritability of the stomach. At no time had her condition been serious enough to keep her in bed.

After trying the Viavi treatment for a time she gave this up and consulted a physician who made a diagnosis of ovarian cyst right side and suggested operation. She then came into my hands for surgical treatment.

Physical examination revealed a woman of rotund appearance. Skin of good color and eyes clear. Examination entirely negative as to heart and chest. Abdomen somewhat prominent, more so on standing, then giving one the appearance of a five or six months pregnancy. Tumor in abdomen easily made out. Irregular, freely movable, not following the arc of movable kidney and not pedicled to the broad ligament. Consistency of tumor as felt through the abdomen must be described as doughy rather than elastic like a cyst.

Uterus freely movable. Ovaries normal to palpation except right slightly enlarged.

Cervix eroded, lacerated bilaterally. Containing two small polypi.

Bladder negative.

Perineum having a moderate degree of laceration.

Believing this to be a tumor of broad ligament origin I made a median line incision extending from the umbilicus well down to the symphisis. Examination of left side of the broad ligament was negative. On the right side of the broad ligament a cystic ovary or more properly cyst on the ovary size of a lemon. This I removed. Then began to investigate what appeared to be a very much enlarged omentum which constantly protruded into the operative field. Delivering this onto the abdomen I found a very much thickened and close knit omentum apparently but on exposing all of the structure found it to occupy all of the lower extent of the omentum and gradually dwindled diagonally toward the right so what we might term half of the omentum was involved in this growth. I removed the same closing the abdomen. The patient made an uneventful recovery except for the development of a severe sciatic on the right side in the third week following the illness.

PATHOLOGICAL REPORT

The omental tumor proved to be a simple lipoma similar in structure to lipomas found beneath the skin. It was very dense in structure. Weight slightly over 1000 grams.

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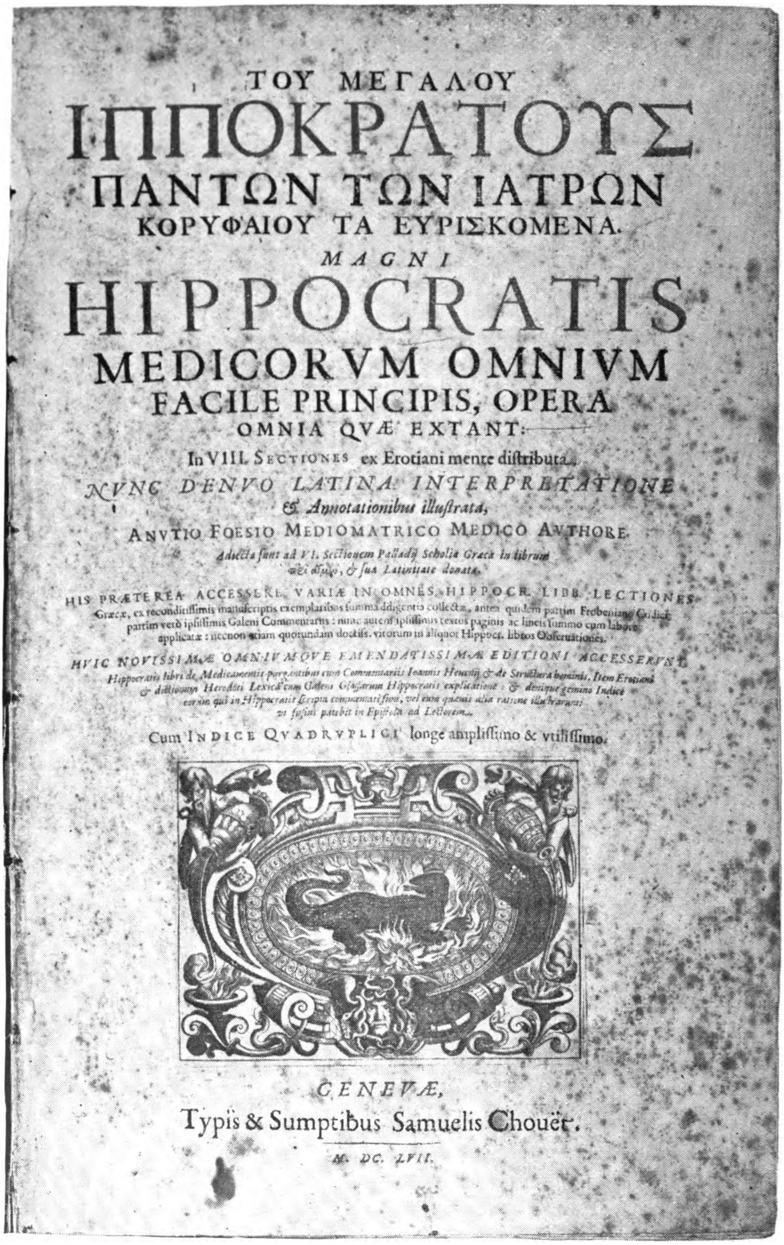

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1657

The Hippocrates of Foesius

BY H. WINNETT ORR, LINCOLN, NEBRASKA

The accompanying notes are a brief description of two volumes which came into the possession of the writer in the summer of 1907. Each of the two volumes is a large folio of about one thousand pages. Following the title page and with the frontispiece (of which cuts are shown) are extensive introductory epistles. These are quoted at some length.

In the introductory pages are to be found also a detail table of contents and an extensive glossary—the later indicates not only all the authorities consulted, but points out the particular parts of the work in connection with which their writings were used.

The text of the work is in parallel columns of Greek and Latin—of beautiful typography. Each section has a heading in large type similar to that used in the title page. While this edition (apparently the second) is dated 1657 the preliminary discourses* are dated 1594 and it is from these that much interesting information in regard to the relation of Foesius to the Hippocratic writings may be gained.

Dr. Francis Adams in a recent edition (1880) of the works of Hippocrates says, "Perhaps we may venture to affirm, without much risk of challenge, that the works of no ancient author owe more to the exertions of a single individual than those of Hippocrates do to the labors of Foesius. Of his excellencies as an editor, and expositor of the meaning of his author, I will have occasion to speak afterwards; and here I shall merely state regarding him, that as a critic called upon to decide with regard to the authenticity and spuriousness of the different works, his merits are by no means proportionally high. He rarely or never ventures to differ from Galen, and everywhere evinces so easy a disposition to recognize the works in question as being the productions of his beloved author, that his opinion on any point connected with their authenticity is not deserving of much weight."

This is so fair a comment on the work of Foesius that it may well be allowed to stand. No one, however, who has not carefully examined this Geneva edition of 1657 and who has not read the introduction to the work can have any conception of the

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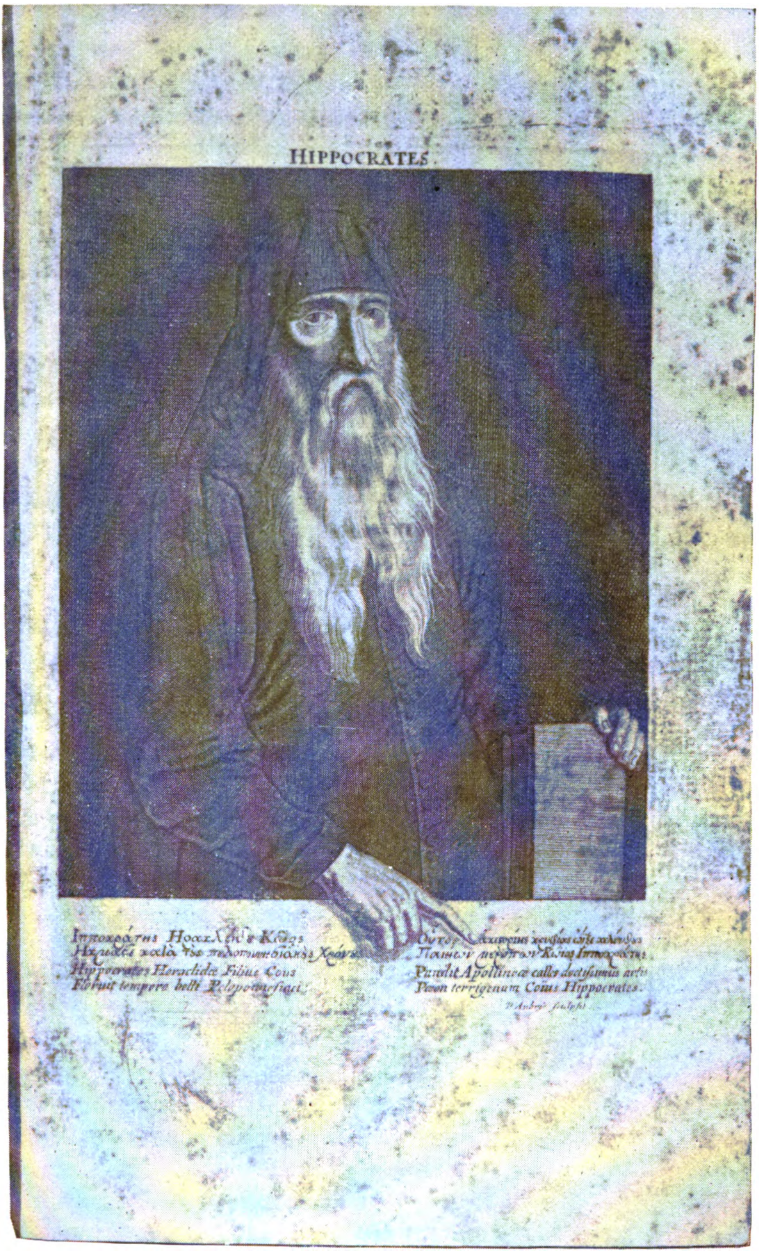
*I wish to acknowledge my indebtedness to Miss Alice C. Hunter of the University for translation of the part of the work used in this article.


HIPPOCRATES
Hippocrates Heraclidæ Filius Cous
Floruit tempore belli Peloponnesiaci.
Pandit Apollineæ calles doctissimus artis
Pæan terrigenum Cous Hippocrates.
P Aubry sculpsit

Illustrating "The Hippocrates of Foesius" see page 100

wonderful monument which Foesius erected to the memory of Hippocrates.

Foesius dedicates his work to Charles of Lorraine "most noble cardinal, pontificial legate, Bishop of Metz, etc." He tells the prince that he had long contemplated a Latin translation of the writings of Hippocrates. In involved but eloquent sentences he dilates upon the illustriousness of Hippocrates and his importance as an author, though he deplores the obscurity of the writings of Hippocrates and on this account he emphasizes his wish to "turn all the keenness of my intellect to translating and explaining Hippocrates, the father of medicine" and modestly regrets his inequality to the task.

"When I set before myself all the care and diligence to be employed in obtaining this result, I felt that I must exert myself first in this respect because he led the attempts of all far from himself on account of the abstruse difficulty of the subject and his understanding which was far removed from the common conjecture of all, and also because he deterred the noblest intellects because of the recondite and wonderful learning of the author. With this explained he would come into common use and the hands of all and would arouse the admiration and agreement of all men."

"And altho I bent to this task with readier mind still I was afraid lest I should show forth the slowness of my intellect and the meagerness of my assisting art rather than that any one happier from all praise of genius and wiser, in short, from all the culture of training, should be able to adorn (the task) rightly with words and to comprehend and embrace it with acumen of mind. But altho I feel that I am only moderately prepared by training and also more meagerly by nature, surely those ought to be considered profuse boasters of the praises of others, who taking into account the integrity of strength only neglect outward appearance, vigor and spirit and desire us to decide concerning the whole matter of judgment and danger of reputation. And just as in a consideration of health it is not enough to have care for unimpaired condition, soundness, strength and sinews of the body and it is not so much to be feared that you get defective blood as that you should not lose sound and uncorrupted blood in which there is present a natural, not counterfeit strength so in this arrangement of studies one must not depend upon the judgment of others concerning you to such an extent that you will not summon to your planning the keenness of your own mind and permit your own commendation of genius, from the fickle spreading forth of another's praise, to come into suspicion. Removing, therefore, all considerations I have decided to apply myself to the desire of most excellent men. For I preferred, altho I had yielded to their desire, that my prudence be missed by them than, if I did not do this, my good will."

Foesius sets forth in glowing terms the glory of the family of Charles of Lorraine. "The more reasonable, to be sure, is it, most distinguished prince, to cover my weakness with the dignity of your name. This whole treatise, which now at length after long contemplation I have dedicated to you, has vast deserts which merit the pardon of all and many abrupt precipices from which, with your guidance and the splendor of your most distinguished family, I am sure that I can escape. For I hope that you are about to honor Hippocrates, this father of medicine, with that good will and favor with which you embrace all learned men and with the dignity of your most noble name defend and vindicate my work against the calumnies of all evil speakers." Foesius expends many elaborate phrases in acknowledgement of his obligation to the prince for his having stood sponsor to his work. "Urged on by these many and important reasons, I approach the task, most distinguished prince, and I permit my Latin Hippocrates to come to the decision of judges under your auspices."

Foesius in his fulsome dedications to the Prince almost leads us to believe that his is but a small part in the work. "But at any rate lovers of medicine will certainly have from you this favor that for reviewing in use the recondite learning of Hippocrates, for renewing it in contemplation, for recalling it in practice and for proclaiming it abroad, they are about to receive, under the auspices of your name with the most grateful inclination of mind, all my skill in medicine which I have contributed to increasing in all the course of my life with intense prosecution of studies. And that I may answer these, I shall devote myself to this, body and soul, forever, nor shall I ever spare any labors and watches. Indeed, most distinguished, prince, they who have imposed this task upon me will be debtors to you, because it is necessary that this edition, even if not published with my commendation, yet does appear under your name."

Following the dedication is an address to the College of Physicians in Paris. "Anutius Foesius extends greetings to the most noble and learned order and college of the physicians of Paris." His high purpose in the work is indicated by the following—"I have always thought that it would be not only glorious for us but also especially useful and pertinent to the welfare of us all, that Hippocrates, the greatest prince and god, as it were, of medicine, should be constantly in the hands of all doctors and should sound forth in the public theaters of physicians. For this reason, then, I have bound myself to the oath of allegiance of your healthful warfare, i. e., of medicine, and I have applied all the pains of my study to translating, handling and explaining Hippocrates himself and in this I have set up the tent as it were of my life that Hippocrates, in himself involved and obscure made clear and plain through the copiousness and generosity of Galen, might be in the hands of all."

Foesius calls attention to the fact that his original design in translating Hippocrates was to render the writings more useful for himself. He says, " When then I was preparing this for my own use and was singing (as is said) for myself, the importune demands of my friends caused me to apply myself to translating Hippocrates and to bringing forth, not unwillingly, to the public advantage all of that which I had destined for myself."

How largely his friends were instrumental in persuading him to undertake the task of a complete translation is shown by the statement, "In this the fault of having placed the burden belongs to my friends and to me the fault of having undertaken it."

The plan of the work is indicated briefly as follows: Foesius places first those chapters which deal with the art of medicine, second, with indications or symptoms, third, natural causes, fourth, the manner of life, fifth, treatment, sixth,"that part of medicine which effects cures by the hand," seventh, miscellaneous, and eighth "foreign and alien matters."

Foesius says that he included sixty of the writings of Hippocrates in his work and that while he followed the plan of Erotian he does not pretend to have been governed in all details by him. He frankly acknowledges his adoption of Galen as an authority in regard to the authenticity of Hippocrates writings.

"And certainly I do not think it necessary that anything be said by me at this time about the worth and authority of Hippocrates' books, both because I think that the judgment and opinion of Galen, the best interpreter of Hippocrates, has been set upon this." "And just as I do not approve of making a confiscation of the good in reviewing Hippocrates' works, so I determine to rely strongly upon Galen's judgment and criticism."

The profound admiration of Foesius for Hippocrates and the esteem in which he held his writings may be gathered from the following—

"At any rate it has always been my view, which I shall never permit to be wrested from me as long as I live, that in pursuing medicine no other judgment than that of Hippocrates should be chosen. This Galen also in his very rich writings has confirmed, for he often in his rescripts cries out 'O guide and author of all the good' (O first and noble guide for us) and commends him to eternity and consecrates him.* If then to this celebrity of so great a name I have added all my reasoning and all the ability of my intellect (so that I place him before us all as the guide for our journey, walking in whose foot steps, we can obtain the experience of this life, not so promptly and freely as healthfully) certainly great gratitude must be felt by all because in my hard studies I have looked out for both public and private utility."

"But in truth this Hippocrates himself sufficiently commendable in his own name and age and afterwards adorned by the praises of all, I shall treat, especially before you, with no other honor than (to say) that divine honors were paid to him in Greece, once the parent and nurse of all philosophy, and that Marcus Tullius (Cicero) that most rich author†, made him equal to Aesculapius and compared him with him."

Some conception of the labor expended by Foesius upon his translation may be gathered from the following paragraphs of the dedication to the Paris College of Physicians. "It will be enough if, in that which makes for the credit of my undertaking, I shall disclose to you that, in this translation of Hippocrates I have employed many manuscripts and especially the Vatican

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*Lib. ad Glauc. initio. & lib. 1 de Vena sact. adeurs. Erasister.
†Lib. 3. de Nat. Deox.

parchments, which Fabius Calvus wrote that he had used and thoroughly examined for fifty years, and then also I have added to the plan of my work three manuscripts from the royal Fontanobellaean library. And since this has been procured for me by the care of D. Hollerius and D. Gaupylus, I have also made a supply of the readings which have been noted by me from these manuscripts for D. Hollerius. And to the pious shades of these with these obsequies I return deserved thanks and to you indeed, most august fathers, from whose encouragement and training these things have been drawn and culled, with perpetual and dutiful esteem, I vow, dedicate and offer my translation of Hippocrates, as a testimony of a mind that is very grateful to you. And this I wish to come to the public, if not with your commendation at any rate repaired and protected by the nobility of your name, so that its patrimony of worth may not be stolen by some wicked robber, if in any way you, good parents and faithful tutors, defend it, and undertake its patronage.

"From Metz, on the Ides (15th) of March 1594."

In a brief address to the fair reader dated six months later than his dedication to the College of Physicians in Paris, Foesius brings out the fact that just as his manuscript had been submitted to the printer there were brought to him two important manuscripts; one the Aldine of Albert Fevreus and the other the Frobenian of Ludovicus Servinus from which he decided to incorporate certain parts into his work. He says, "In the transcript of Fevreus since many things have been very diligently added from the Greek scholiasts and placed in the margins and between lines, and many parts are filled with notes and explanations of foreign terms, I have selected only such as referred to the text of Hippocrates. I have added a few chosen with deliberation from the Scholiasts and these most of all which seemed to have most to do with an understanding of Hippocrates." "In the transcript of Servinus except that it seems to me to conform accurately to the royal manuscript and is especially rich in readings from the manuscript of M. Cordaeus, I have aimed to set forth diligently the old reading, and to leave various readings, most studiously added from many passages in Galen, as clear to anyone, and to omit many very faithful annotations of passages from Hippocrates himself, and to add in all a few conjectures and these only which seemed to me best to explain the sense of Hippocrates."

The second volume of the work contains the very elaborately prepared commentaries and index. The erudition displayed in the interpretation of Hippocrates has already been commented upon by many writers but even apart from this the enormous amount of labor which must have been expended in so carefully considering a work of this magnitude entitles Foesius to the greatest credit.

The character of the work done throughout is such as to put many a modern author to shame. It is possible, of course, that errors of typography occur but in general these two immense volumes of Hippocrates present a finished appearance which is often lacking even in productions of the present day. If we were all as painstaking and as industrious as this author of more than three centuries ago our volume of literature might be less but its value would certainly be greater. To any budding author or editor with aspirations for permanent enrollment in the annals of literature this magnificient work of Foesius is highly com mended as an example.

THE BULLETIN

OF THE

UNIVERSITY OF NEBRASKA

COLLEGE OF MEDICINE

ROBERT H. WOLCOTT, Acting Dean, Lincoln
HAROLD GIFFORD, Associate Dean, Omaha

THE BULLETIN is published quarterly in January, April, July, and October, by the University of Nebraska, at Lincoln, Nebraska

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Single numbers of THE BULLETIN may be had for 50c each. Complete volumes or subscription by the year $1.00

All communications relating to THE BULLETIN should be addressed to
DR. A. E. GUENTHER, Station A, Lincoln, Nebraska

EDITORIAL

In 1883 the University of Nebraska established a college of medicine in Lincoln which was discontinued in 1887. In 1893, Dr. Ward was called to the chair of zoology, and the year following the writer came, as instructor in the department, to assist him in the development of a pre-medical course, announcement of which appeared for the first time in the calendar for 1894-5.

This course proved a success; with the training it gave students came to be admitted under most favorable conditions to eastern medical colleges and everywhere proved their ability in competition with the students trained in the colleges there. However, a demand arose, constantly becoming stronger, that this university should complete the training of its own students instead of compelling them to go elsewhere, and this at a time when there was a strong movement in the direction of affiliation between the stronger purely medical schools in the large cities and neighboring universities.

Negotiations were entered into with the Omaha Medical College, an institution founded in 1880 and one which had enjoyed a strong and steady growth. But these came to nothing definite until in May, 1902, through the favoring influence of Chancellor Andrews, an agreement was entered into by the terms of which the Omaha Medical College became the College of Medicine of the University of Nebraska, with Dr. Ward as dean. Thus were linked together the laboratory facilities of a great university and the clinical advantages offered by a city population of two hundred thousand people.

This, which was in the nature of an experiment, has also proven a decided success. Dean Ward, himself not a physician, though the son of one, blessed with great vitality, possessed of untiring energy, and assisted by a strong faculty, both in Lincoln and Omaha, has seen the college develop into one ranking among the best in the country, and recognized abroad in a manner shared only by a few. Dean Ward entered upon his administration known as a well-trained scientist and a skilled educator; that he was in the highest degree successful in this new field is attested, not only by the success of the school, but also by his election to honorary membership in medical societies of the highest rank and by his selection, in 1908, as president of the American Association of Medical Colleges. This success was only attained, however, at the cost of unremitting attention to the demands of his position. Those alone who have been intimately associated with Dean Ward know how untiring has been his devotion to the College, how many obstacles have been met and overcome, with what care all his plans have been laid, and how patiently he has worked day after day, night after night, often even into the "wee small hours," to bring the school up to the high position it now enjoys. The University owes very much to the labor of this man who now goes from us leaving the College of Medicine in our hands.

And it is for the students in the College, the members of the faculty, and the medical profession of the state to say whether or not this work, so well begun, shall be continued and the school go on to even a brighter future. It is a part of the school system of the state; every physician, as a citizen, contributes to its financial support, and should have the pride and interest in it which every citizen should have. But more than that, as a member of the medical profession, he should have a personal interest in its success and in the maintenance in it of the highest standards of medical education. The duty of the school as a college of medicine is to train efficient physicians, to send out men who by their technical skill will command the confidence of the communities in which they locate; its duty as a part of the state university is to send out only physicians of pronounced mental ability who have acquired a scientific point of view and are possessed of strong moral character, able to assist the profession in maintaining before the people of the state the high position it has and should retain. The College has the right to to ask of every physician in Nebraska his active support in the performance of these duties.

Naturally membership in the faculty must be confined to few even of those conveniently located. But those who have become associated in this capacity form a body of men of whom the profession can be proud. The College could never have attained the position it has had the faculty not been composed of men with high ideals laboring unselfishly to advance its interests—none of them adequately remunerated, many receiving no remuneration at all, and some even at considerable personal sacrifice of money and more precious time. These men are broadminded, they will not prostitute the school to the interests of any locality or clique, but will continue their instruction in accordance with the highest ideals of medical education and in such a manner as to meet the approval of all high-minded physicians and of the people of the state.

The student body is one of which the College is proud, in which the University and the profession may well take pride, and entrance into which may be esteemed an honor by the prospective student of medicine. Its members have never failed to answer faithfully to the demands of a heavy schedule, trusting in the efficacy of hard work intelligently directed, and so far no man who has been graduated from this school beginning with the class of 1906, the first to enter after the affiliation, has failed to pass a state board examination.

The strength of eastern colleges is generally considered to be due in large measure to loyal bodies of alumni, who return year after year to their alma mater, who send their own children and direct those of their friends and neighbors to the old halls in which they worked, who are ever ready with advice and material assistance to hold up the hands of those in authority. Judging by the past we rest confident in the support of loyal and active alumni to whom the College gave unreservedly of her store of knowledge and opportunity, and who have honored her in the practice of their profession.

The acting dean bespeaks the fullest support of this student body which he will advise, of these alumni who are the fruit of previous effort of this faculty with which he will counsel, and of this profession which he will serve, pledging his own efforts, to the limit of his ability, to maintain within the school the highest standards, to advance in all directions its interests, and to enable it to minister to the utmost to the advancement of the profession which it represents.—*Robert H. Wolcott.*

John Hunter, biologist, anatomist and surgeon, did not rank very high as a student or producer of literature. His own library is said to have been small and many of his writings fall far short of what we know to have been the scientific attainments of the man. He believed that he could learn more from the study and observation of natural objects than by reading what anybody else said about them. In the pursuit of knowledge by this method he acquired an ability which has been equalled by but very few scientific men.

Hunter accumulated thousands of specimens which form the basis of the Hunterian museum. These he secured, examined and classified at an enormous expense of both energy and money. The museum has been a source of instruction and inspiration to many scientific men since that time, but undoubtedly nobody received more benefit from the Hunterian museum than John Hunter himself. No better illustration could be found of the maxim that we benefit ourselves most by benefiting others than by such work as this. Those who render to their fellow men the most valuable services really help themselves the most. The University of Nebraska needs a museum of anatomy and surgery. It can be arranged for the museum of anatomy to have its quarters in the museum building on the campus at Lincoln. It can undoubtedly also be arranged for a museum of surgery to have adequate accommodations in the buildings planned on the new campus at Omaha. It only remains for someone to appear who is able and willing to bring together material for the building up of such an institution. Such a collection would be extremely valuable as one of the adjuncts to our educational equipment. It would stand as a constant inspiration to our students and would no doubt lift into greater prominence that member or those members of the faculty who were instrumental in founding and developing the museum.—*H. W. Orr.*

The following from the editorial columns of the Omaha Bee indicates an attitude which will afford pleasure and satisfaction to every friend of the university.

BUILD UP THE MEDICAL SCHOOL

"The enforced change in the headship of the medical school of the University of Nebraska through the acceptance by its dean of a position in another institution should not interfere with the execution of the plans that have been laid out for the development of this department of the university. Inasmuch as the clinical courses of the medical school are pursued in the hospitals and laboratories in Omaha after the students have completed the preliminary work at Lincoln, it is quite natural that Omaha should be more directly interested in this side of the university.

"Omaha is the seat of two medical schools, both of which are credited with doing most excellent work, and both of which have a large field of usefulness before them. Omaha furthermore is equipped with the largest and best hospital facilities of any city between the Mississippi and the coast, and our medical and surgical practitioners and specialists average in rank with the foremost. Only by building up these medical schools will full advantage be taken of the clinical material and instructional opportunities presented here, and the education of students in medicine is as important a part of the state university as the education of students in any other of the professions or occupations requiring specialized preparation.

"While the plans laid out for the medical school may look considerably to the future, with the co-operation of the loca community and the regents in charge of the university, they can be all realized upon gradually and lead eventually to a valuable institution of far-reaching and lasting influence."

—*Omaha Bee, July* 8, '09.

The college of medicine is now well past the experimental stage as a department in the university. That Dr. Ward more than any one else deserves the credit for the present status of the college, we must all admit—but those of us who have benefitted by his example and instruction, and who have gained inspiration by association with him, must now devote ourselves to the task of furthering what Dr. Ward and those associated with him have so well begun.—*H. W. Orr.*

SOCIETY ELECTION

At the forty-first annual meeting of the Nebraska State Medical Association, held in Omaha, May 4-6, the following officers were appointed: President, Dr. P. Harold Salter, Norfolk; vice-presidents, Drs. William J. Birkofer, Gothenburg, and William H. Wilson, Lincoln; secretary, Dr. Alonzo D. Wilkinson, Lincoln; treasurer, Dr. Alexander S. Von Mansfelde, Ashland; delegates to the American Medical Association, Dr. L. Matt Shaw, Osceola, and alternate, Dr. Theodore P. Livingston, Plattsmouth; chairman of section on surgery, Dr. Arthur C. Stokes, Omaha; chairman of section on medicine, Dr. H. Winnett Orr, Lincoln; chairman of section on gynecology and obstetrics, Dr. Edwin C. Henry, Omaha; chairman of committee on public policy and legislation, Dr. Charles W. M. Poynter, Lincoln, and chairman of committee on medical defense, Dr. Alexander S. Von Mansfelde, Ashland. Drs. Ernest J. C. Sward, Lincoln, and Clifford P. Fall, Beatrice, were recommended for members of the State Board of Health.—*Jour. A. M. A.*

COLLEGE NOTES

Dr. R. A. Lyman, director of the school of pharmacy, was honored at the recent meeting of the Nebraska State Pharmaceutical Association held at Lincoln, by being elected vice-president of that association as well as delegate to the American Pharmaceutical Association which meets at Los Angeles, California, August 16th to 20th, 1909.

The annual luncheon of the Alumni Association occurred at the Rome hotel in Omaha at two o'clock on commencement day. About sixty members were present. After the luncheon the association was honored by a brief address from the commencement orator, Dr. W. W. Keen of Philadelphia. At the business meeting Dr. W. R. Lavender of Omaha was elected president and Dr. Thomas Truelsen, also of Omaha, was made permanent secretary. The association decided to discontinue the annual fall meeting and to concentrate all its efforts on the commencement gathering. The advisability of establishing an alumni research scholarship or devoting the money to some other purpose for the benefit of the Alma Mater was discussed. It was finally decided to request the committee which has had the matter in charge to proceed to the obtaining of pledges of definite amounts and to leave the disposal of the same to a vote to be taken at the next annual meeting. The committee consists of Drs. Truelsen, Stokes, and B. W. Christie, all of Omaha.

Members of the University faculty at Lincoln who attended the commencement exercises at Omaha were, Chancellor Avery, Dean Ward, and Professors Waite, Dales, Wolcott, French, Barker, and Lyman.

At a recent meeting of the Board of Regents, Mr. Niels P. Hansen of Lincoln was appointed lecturer in pharmacy in the University School of Pharmacy. Mr. Hansen is one of the leading pharmacists of the state. He is an ex-member of the Nebraska State Board of Pharmacy and a business and professional man of high standing. He will offer a series of lectures on the business aspect of pharmacy. The University considers itself extremely fortunate in obtaining the services of Mr. Hansen.

Dr. A. D. Cloyd read a paper on "Instruction on Life Insurance in Medical Colleges," at the last meeting of the American Association of Medical Examiners at Atlantic City. This paper will be published soon. Dr. Cloyd will spend August at Santa Monica, California.

The staff of Douglas County Hospital, Omaha, has been reorganized under the direction of the county commissioners. An executive council was appointed consisting of Drs. Herschel P. Hamilton, Palmer Findley, and Frederick W. Lake. Dr. Wilson O. Bridges has been appointed consulting physician and the heads of departments are Dr. Paul G. Woolley, pathology; Dr. Solon R. Towne, hygiene and sanitation; Drs. Frederick W. Lake and Rudolph Rix, diseases of children; Dr. Palmer Findley, gynecology; Dr. Frank E. Coulter, mental and nervous diseases; Dr. Alonzo E. Mack, obstetrics; Dr. Frank S. Owen, diseases of the eye and ear; Dr. William F. Milroy, medicine, and Dr. Herschel P. Hamilton, surgery.

Dr. H. Winnett Orr was elected to membership at the 23d annual meeting of the American Orthopedic Association at Hartford, Conn., June 14th to 16th. Dr. Orr became a candidate through the courtesy of Dr. John Ridlon of Chicago who proposed his name at the meeting in Chicago June 1908. The nomination was seconded by Dr. J. L. Porter, also of Chicago. Dr. Orr's thesis presented to the membership committee at Hartford was on the subject "The Role of Foot and Leg Muscles in Flat Foot." This having received the approval of the membership committee a ballot at the last executive session of the meeting resulted in his election. The entire membership of the American Orthopedic Association is now about eighty and Dr. Orr is the first physician to be elected from Nebraska.

Prof. J. H. Powers is devoting himself to some special work during the summer at Biological Station at La Jolla, California.

Dr. J. M. Aikin left Omaha August 10th accompanied by his wife and daughter for a visit at Lake Okoboji. Dr. Aikin is planning to enlarge his hospital and clinic work during the coming year and some special features in the department of Nervous and Mental diseases are being arranged for the benefit of the senior students. Saturday morning clinics and special cases will be features of Dr. Aikin's work.

Prof. F. D. Barker had charge of the Nature Study Club for boys conducted by the Omaha Y. M. C. A. during June. He is spending July and August in Northfield, Mass., combining a brief period of rest with some special study.

Dr. W. O. Bridges sailed for Germany July 24th. Dr. Bridges was commissioned as special delegate from the College of Medicine to the International Medical Congress at Budapest. He is planning to visit a number of points on the continent and will return by way of the Mediterranean to resume his work in Omaha about the last of September.

Dr. G. H. Walker, '08, has opened office in the Richards block, Lincoln. Dr. Walker has been employed as House Physician at the Sunlight Sanitarium for the last year.

Dr. Clarence Rubendall, who recently completed a year's service as Interne at the Immanuel Hospital, Omaha, has opened an office at 202 Richards block, Lincoln for the general practice of medicine.

Dr. H. P. Wekesser has just returned from a trip through western Canada, looking at land in the "Last Best West." Dr. Wekesser says that there are many people from the States locating in the new country in western Canada and that there are good openings for physicians.

Dr. B. W. Christie reports that he is spending the summer in Omaha and devoting himself assiduously to his professional work.

Dr. Alfred Schalek spent two weeks during the month of July among the lakes near Haywood, Wisconsin. The doctor returned to Omaha about July 15th and is now engaged in a new addition on his work on Dermatology which will be published during the coming winter.

Dr. J. M. Patton is spending the summer in Europe. He expects to devote about four months in London, Vienna and other European cities, making a special study of diseases of the nose and throat. The doctor is accompanied by Mrs. Patton.

Dr. J. F. Stevens whose recent appointment to the department of pharmacology has already been announced, is spending the summer in Lincoln. He says that he is engaged in a recent study of the treatment of some tuberculous patients and is endeavoring to solve some problems which he finds very interesting.

Dr. A. O. Peterson with his wife and son left Omaha July 24th for Rockford, South Dakota. Dr. Peterson is relying upon his former record for a successful season in trout fishing in Castle Creek and will return to Omaha about September 1st.

Dr. R. G. Clapp who teaches every summer in the Chautauqua School of Physical Education in New York is engaged in the same work again this year. June 28th to July 2d he attended the decennial reunion of his class in Yale.

Dr. W. F. Milroy remains in Omaha during the summer.

Dr. R. C. Moore is spending the summer at home.

Nebraska College of Medicine Closes Voluntarily

Recognizing the rapidly increasing demands of medical education and the impossibility of its meeting these demands with the means at its disposal, the Nebraska College of Medicine has voluntarily closed its doors. This action was taken by the faculty at a meeting held May 19th. In an open letter to the president of the Nebraska Wesleyan University, with which the medical school was affiliated, Dr. J. F. Stevens, dean of the medical college, sets forth the reasons leading to the action taken. After giving a brief history of the opening and progress of the medical school, Dr. Stevens continues:

"We would respectfully call your attention to the fact that educators and physicians throughout the United States, recognizing the inferiority, on the whole, of the American medical school, as compared with those of Europe, have determined to raise the standard of medical education to such a point that our colleges will command the respect of the world. While academic training and opportunity have grown into magnificent and commanding proportions, the professional schools, with the exception of a small minority, have remained essentially elementary or even worse. The spirit of progress has at last become supreme and on all sides may be seen the work of destruction, reorganization, and rebuilding. The American Medical Association is doing a splendid work in securing and digesting statistics, and reflecting the strengths and deficiencies of our institutions. The Carnegie Foundation, in a different manner, lends its words of wisdom, and a multitude of smaller bodies and societies, including state examining boards, are working together with hardly a discordant note, for the same purpose. Standards of entrance requirements have been raised to such a point that one full year's work in an accepted college or university is required for matriculation. Soon it will be two years, and later a bachelor's degree will, without doubt, be the *sine qua non.* Small colleges that have found it impossible to stand the strain of such requirements have been forced either to step from the field altogether, or to merge with some other school. In several states nearly, or quite all, of the small schools have been blended with the state institution. At the same time the requirement is going forth that schools shall have at their disposal a dispensary and hospitals sufficiently patronized to permit of a very wide study of disease. These requirements can not be met in a small city. Again, with the rapid advancement in medicine has come the need of costly laboratories, under the direction of highly cultured men. Subjects, too, that once belonged to the 'mere mention' hour in the course of study, have developed into great fields with divisions and subdivisions, each demanding a special training for its comprehension and most certainly for its proper teaching. None of these requirements insisted on by educators and the medical profession generally is in excess of what it should be, and this institution is in full harmony with that view. . . . We fully realize that to maintain our standing and dignity as medical teachers, in the continuance of our college, it will be necessary to add to our working force a goodly number of trained instructors. This we can not do, and because of this, and for the reasons easily deduced from the above discussion, it has been decided best for our institution to voluntarily close our doors, in the interest of higher medical education."

The action taken by the faculty of this college is but another evidence that medical educators themselves realize the desirability that medical teaching in America be improved until it is at least on the same high plane held in other leading countries, and that they are willing to make great sacrifices, if need be, to attain that end. It is this spirit so frequently manifested by our medical educators, which is an inspiration to those working for better standards and which is sure to bring results.

—*Comment of the Jour. of the A. M. A.*

Dean and Mrs. H. B. Ward were at home to the class of 1909 of the University of Nebraska College of Medicine Thursday evening, May 27th. All the members of the class were present to meet Dean and Mrs. Ward and other members of the faculty who had been invited. In the absence of Dr. Ward who was delivering a commencement address at Wymore, Dr. Palmer Findley of Omaha read Dr. Ward's address to the members of the class. Dr. Ward's words were as follows:

"Permit me hereby to extend my congratulations to the Class of 1909 and best wishes to all the faculty and students in the College of Medicine. By an unfortunate error an engagement to deliver the High school commencement address at Wymore, which I thought had been scheduled for Friday, May 28, was fixed for Thursday, May 27. After the commencement invitations had been printed and issued it was impossible to affect any change and in justice to the graduates and friends of the Wymore school I felt compelled to go there today and fulfill the program as announced. I regret more than it is possible to express here that I cannot be with you all for a pleasant social time but I feel confident that you will be not only safe but happy under the charge of my good wife and our friends and will enjoy the opportunity of meeting your associates and talking over matters concerning the College and the University.

"This has been a great year for the College. We have secured an appropriation from the legislature for purchasing a campus site in the city of Omaha, we have been successful in obtaining one which is admirably central in location, conveniently related to street car facilities and to the hospitals under our control. We have, furthermore, done much towards completing the arrangements which will give us the sketch plans for the group of buildings to occupy this campus; we have had successful negotiations with interests which propose to erect individual buildings of this plant and we see within our grasp a group of structures that will be the pride alike of students and state. Those of you who have cast your lot with the University of Nebraska College of Medicine will never have reason to regret your choice. It has already achieved a very high record among the medical colleges in the land. It will with passing years gain in honor and prestige until it occupies that position of leadership for which we confidently believe it is destined.

"Do not, however, fail to keep in mind one thing. The present progress has been achieved in a large degree through the self-sacrificing efforts of both faculty and students. On the one hand your teachers have sought through every possible sacrifice of time and strength to set before you the very best in medical training, in the best possible manner. You have been privileged to come in direct contact with them. You have not been intrusted simply to the charge of inexperienced assistants but you have enjoyed personal training at the hands of men of experience and honorable reputation in the fields of science and medicine. The longer you live and the more you gain the power of judging aright the quality of your training the more thoroughly satisfied will you become with this unique privilege which has been yours.

"On the other hand let me say equally frankly that while from time to time there have been minor criticisms or differences, yet on the whole the student body has worked energetically and enthusiastically for the highest success of the institution and for the achievement of the best results obtainable through the training offered them. While many of you have been compelled to devote some time to outside matters in order to meet the necessities of the case, yet you have put in much hard work to gain a thorough mastery of the material presented to you. I confidently challenge any institution to show so high an *average* standard or so thorough a mastery of the subjects covered as has been achieved by our University classes in medicine.

"Our buildings have not been good but our equipment is thoroughly high class and adequate for the purpose of instruction. When we get the new structures in the future towards which all of us fondly look, remember for yourself and for those who follow after you that the success of the institution cannot surpass its present achievement or indeed hope to equal this unless the students then shall be equally willing to devote their entire strength and energy to the mastery of the work that is presented to them.

"To the new doctors I send my very best wishes that each may be abundantly successful in the career on which he has entered. I hope that they will visit their Alma Mater frequently, will help her by their advice to plan for a great future and will aid in bringing under her wings those ambitious students who will make such use of the facilities as to reflect credit upon themselves and their foster mother. To the others I extend equally hearty wishes for success in approaching examinations, a pleasant summer and promise of a hearty welcome on your return in the fall."

This reception to the members of the graduating class is an annual affair which is always very much appreciated both by the members of the class and the members of the faculty who are given this opportunity to extend well wishes to those who after four years are leaving their studies for active work in the profession.

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